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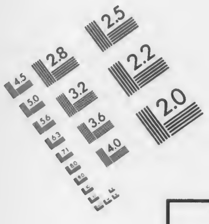

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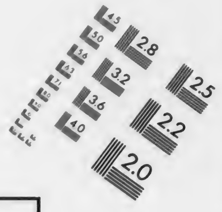

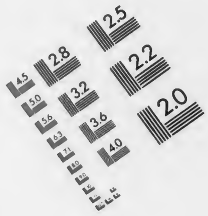

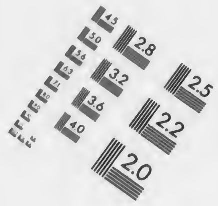

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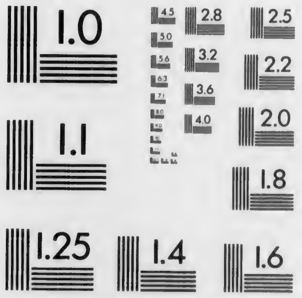

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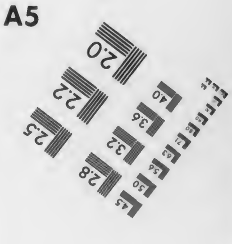

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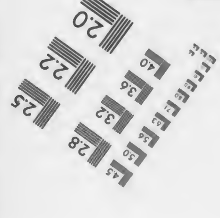

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ESTIMATES OF RAILROAD FREIGHT REQUIREMENTS
AND OTHER TRAFFIC DATA

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Prepared by William N. Leonard
Transportation Section
Office of Civilian Requirements
WAR PRODUCTION BOARD

June 8, 1943

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JAN 23 1951

Foreword

This material has been reproduced, not merely to publicize the railroad freight traffic estimates of the Office of Civilian Requirements, for these may be changed overnight by any one of a number of forces, some unpredictable and others which should probably have been foreseen in this study; but to indicate the outlines of some of the major problems which our rail transportation system must face during the next six or eight months, and to make available to other Government agencies and transportation groups the tables and analysis of commodity movements which follow.

The study makes no definite suggestions regarding construction of locomotives, freight cars, or rail facilities of any kind, but merely indicates some areas where car shortages or congestion are likely to occur. No proposals have been made for governmental or private action to curtail, restrict, or in any way control, rail freight traffic, although vigorous action will undoubtedly be needed to relieve some of the critical situations now developing.

* * * * *

Acknowledgement is made of the very considerable help received from other Government agencies and private associations, especially the Department of Agriculture, Bureau of Mines (Interior Department), the Office of Defense Transportation, Office of Price Administration, and various Industry Divisions of the War Production Board; also the Association of American Railroads, and numerous industrial associations.

A great deal of the work has been performed by other members of the Traffic Section, principally Mr. H. R. Gardner, Miss Florence Isaacs, and Mrs. Fanny Buford. Thanks are also due to Miss Helen Antman, Miss Irene Caputo, Mrs. Irene Dayton, Miss Helen Ledarich, and Mrs. Frances Seamster for their part in typing the many pages of the study. Special thanks are owed to Dr. H. D. Koontz, Chief of the Transportation Section, without whose assistance and encouragement this study could not have been completed.

ESTIMATES OF RAILROAD FREIGHT REQUIREMENTS AND OTHER TRAFFIC DATA

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Table V, Use of Equipment by Commodity Groups & Classes.

SUMMARY

It is estimated that Class I carriers will handle 716 billion ton-miles of revenue freight in 1943 or approximately 12 percent more than they carried in 1942. This represents a considerable leveling off from the sharp increases of traffic registered in the past two years. It is expected that revenue ton-miles in the first quarter of 1943 will be approximately 29 per cent higher than during the first quarter of 1942, but thereafter the rate of increase should decline rapidly with ton-miles in the last quarter of the year only 6 percent higher than the total for the fourth quarter of 1942.

The leveling off of traffic will not result from any decrease in length of haul--for the latter is expected to increase markedly during the year--but from a volume of goods offered for rail transportation only slightly greater than the tonnage of freight carried in 1942. It is estimated that revenue tons of freight originating on Class I carriers will exceed that handled in 1942 by less than 5 percent.

Analysis of expected commodity movements indicates that some increase may be expected in the volume of agricultural and animal products moving by rail in 1943, with the largest tonnage increases in the grains and grain products. Among mine products, shipments of coal and coke will be at least 12 percent greater than in 1942, but not much change is expected in the tonnage of iron ore handled by the railroads. Loadings of forest products have dropped substantially in the first months of 1943 and are not expected to regain the level of 1942 shipments. Among manufactures, substantial increases will be registered by chemicals and explosives, petroleum products and military ordnance, equipment and impedimenta. Because of the expected drop in construction, cement, aggregates, and other building materials will move in considerably reduced quantities. Carloadings of revenue freight, as reported by the Association of American Railroads, are expected to decline by from 5 to 6 percent for the year.

Car requirements have been established on the basis of the estimated tonnages of freight shipments for 1943. These indicate increased demand for box, open top hopper, flat, refrigerator, stock and tank cars, decreased demand for gondola and covered hoppers. The largest increases in requirements are for stock, tank and refrigerator cars; heavier loading will probably reduce box car requirements to 1942 levels. This analysis does not take into account two important factors:

(1) Flexibility in the use of equipment, that is, the shifting of commodities from one type of car to another, and

(2) Turn-around time of equipment.

METHOD

The procedure followed in this study has been to compare production figures furnished by various government agencies and private associations with rail shipments as indicated by the commodity reports issued quarterly by the Interstate Commerce Commission. The composition of the various classes of railroad freight has in each instance been analyzed, particular reliance being placed upon the information available in the one-day traffic studies made by the Office of Defense Transportation. The tonnages of revenue freight originated in 1941 and 1942--and in some cases, in 1940--have been compared with statistics of production and stocks; diversion and other changes in distribution have also been taken into account in the analysis of traffic data. Requirements for car equipment have been calculated on the basis of expected tonnage and the use of cars reported in the ODT one-day studies.

Although information on the average haul of individual freight items is meager, an effort has been made to estimate ton-miles for the various commodity groups reported in the study of the Federal Coordinator some years ago. Finally the more important commodity classes were broken down by quarters of 1943 on the basis of information as to their probable movements during the year, and quarterly figures of revenue tons and revenue ton-miles were estimated.

ESTIMATES OF REVENUE FREIGHT TRAFFIC

Revenue Ton-Miles

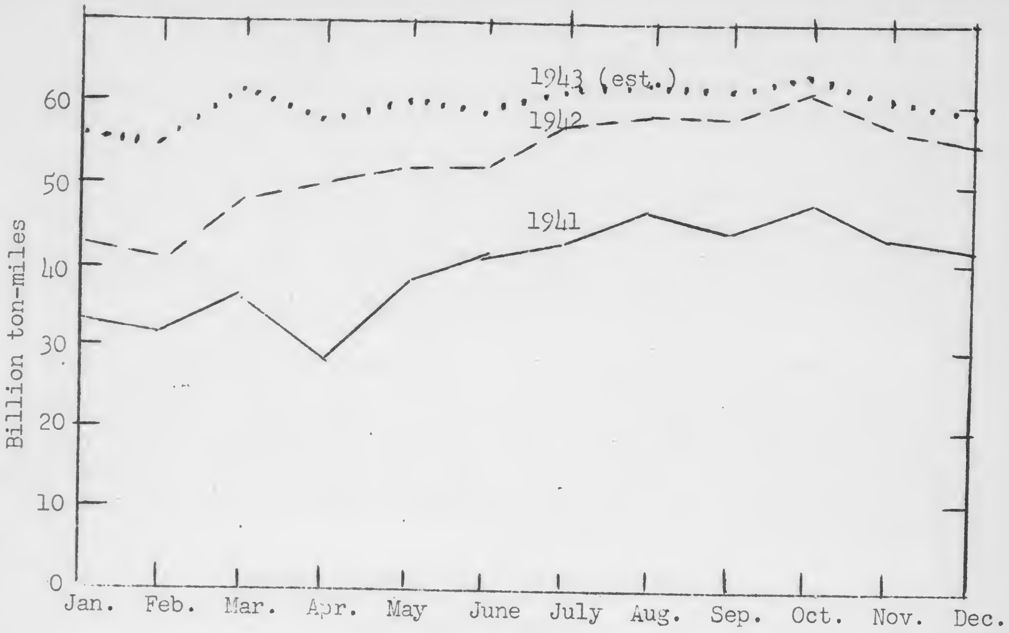
It is estimated that ton-miles of revenue freight will reach 716 billion in 1943, a 12.2 percent increase over the 638 billion ton-miles handled in 1942. For the first quarter the increase is estimated to be 29 percent over the same period of 1942; this margin of increase is expected to decline to 12.3 percent in the second quarter and to 6.5 per cent and 5.1 percent respectively in the last two quarters of the year.

Revenue Ton-Miles
(000's)

	1941	1942	1943
First Quarter	101,375,401	132,028,606	170,500,000
Second Quarter	109,360,294	158,120,054	177,500,000
Third Quarter	132,647,817	173,737,980	185,000,000
Fourth Quarter	131,670,298	174,182,804	183,000,000
Total	475,053,810	638,069,444	716,000,000

Seasonal fluctuations should not be as marked as in past years because of the constancy in output of war industries and because the agricultural harvest will not have as much effect upon total production as in past years. Comparison with the monthly pattern of past years indicates:

(1) The first quarter of 1943 is abnormally high.
(2) The fall peak does not exhibit the sharp rise experienced in other years.
(3) The decline in revenue ton-mileage after October is not as abrupt as in previous years.



Revenue ton-miles have been reported by the Interstate Commerce Commission for the first two months of 1943. The figures are 55.12 billion ton-miles for January and 54.42 billion ton-miles for February. No total for March has been reported by the Commission; but comparison of March freight revenues and net ton-miles with similar statistics for March, 1942, indicates that the March ton-mileage will approximate 61 billion. This would make the total for the first quarter 170.5 billion, slightly more than 29 percent above the 132 billion reported for January-March, 1942.

It is believed that traffic in the first quarter of 1943 has been abnormally high for the following reasons:

(1) Large movements of grains have resulted from the carry-over of last year's bumper crops, from marketing of grain by farmers and relocation of grain stocks by the Commodity Credit Corporation.

(2) Bituminous coal production was maintained at a rate of 12.02 million tons a week during the first 13 weeks of the year, compared to 11.06 million tons averaged in the first 13 weeks of the year, an increase of 8.7 percent. Carloadings of coal during the first 13 weeks were 8.1 percent above 1942.

(3) Movements of livestock and coke were also greater than in 1942. The increase in carloadings for the first 13 weeks was 12.9 percent for the first and 6.3 percent for the second.

It is believed that revenue ton-mileage in 1943 will not climb at the same pace as in 1942 because of these factors:

(1) New construction is expected to be less than two-thirds of the 1942 level. Dollar value of construction projects came to $13,250 million in 1942; the total for 1943 is estimated at $7,500 million, a decline of more than 40 percent (Building Materials Branch, Statistics Division, WPB). March cement shipments, according to the Bureau of Mines were off 20 percent from March, 1942; in April the decline below 1942 was 14 percent. Even greater decreases in cement shipments are expected for the last half of the year. (See Cement under Manufactures and Miscellaneous). This is an indication that shipments of sand and gravel, stone, brick, tile, and other building materials may also be expected to fall substantially below last year's levels.

(2) The late opening of the lake season has reduced the expected tonnage of iron ore shipments almost to last year's level. The lake quota for 1943 is 91 million long tons, as compared with 92 million long tons for 1942. Some additional production is expected of Eastern magnetite and western ores.

(3) Under normal growing conditions the grain crops and other agricultural crops will be smaller than in 1942 where farm production was carried on under unusually fine weather conditions.

(4) Large withdrawals from inventory occurred in 1942, withdrawals which cannot be duplicated in 1943 because stocks are generally lower. This is true of steel products, lumber, cottonseed meal and cake, and many other agricultural, animal, forest and manufactured products.

(5) The large increase in shipments of war material will to some extent be canceled out by decreases in movements of civilian goods.

(6) In 1942, a considerable tonnage was diverted from coastwise shipping and intercoastal movements to the inland carriers, chiefly the railroads. Diversion was particularly great in the case of oil, coal, lumber, steel products and canned goods. The petroleum tank car movement into District I alone accounted for 30 percent of the increase in revenue ton-miles.

It is apparent that most of the shift from coastwise and intercoastal shipping to the railroads has already taken place. The Panama Canal has been closed to cargo carrying vessels since February, 1942, and a major part of the traffic along the Atlantic, Gulf and Pacific Coasts moved inland in 1942. Shipments of coal from Hampton Roads by tidewater declined nearly 40 percent in 1942 and it may be presumed that they will decline still further in 1943. Also no oil tankers may be left in the East Coast service by the end of the year. However, the total volume of coastwise shipping is now so low that diversion of even a considerable part would not add unduly to rail ton-miles.

The late opening of the Lakes has cut down on the task of the railways in one respect and added to it in others. Iron ore shipments from the upper Lake mines will not be any higher than last year--in fact, the quota now stands at 91 million long tons, a million less than last year's record of 92.08 million tons. Fulfillment of this quota, however, will mean crowding some grain, limestone flux and other commodities off the Lakes and onto the railroads. Apparently too, if the large imports of wheat, barley, oats and rye from Canada are realized, they will have to come in largely by rail. Only the speedy completion of the 16 new boats will enable the Lake carriers to match last year's 137 billion ton-miles of freight (estimated). But even if the same amount of traffic is handled on the Lakes, part of the additional requirements for transportation in the Lakes region will have to be shifted to the railroads.

While the pipeline capacity has been expanded so that an increase of 35 percent in the ton-miles of petroleum and petroleum products carried by the pipe lines may be expected in 1943, this will not take any burden from the railroads. Rather it will be necessary to keep an average of 70,000 tank cars in the East Coast service throughout the year to supplement the pipe lines and meet tremendously expanded petroleum requirements for the East Coast and for export.

How much tonnage will be diverted from truck to rail movement in 1943 is highly problematical. In 1942 trucks lost traffic to the railroads in the cases of numerous agricultural and animal products (see Products of Agriculture and Animals and Products within) and in the cases of coal, forest products, steel products and other manufactures. Further diversion from motor carriers may be expected for the above commodities and for others as shortages of labor, equipment and parts continue to develop. Nevertheless, the present rate of truck operations indicates little change from 1942, except in the case of less-than-carlot traffic where the restoration of former rail rates is likely to shift a substantial tonnage to the railroads. All told, ton-miles of intercity motor carriers have been estimated by the Office of Civilian Requirements at 105 percent of 1942; and signs of unusually heavy shifts of tonnage from trucks to rail carriers are still lacking.

It should be pointed out that very little account has been taken in this study of the possible effects of future governmental action. Such action may affect transportation directly, such as orders designed to restrict cross-hauling and other forms of excess transportation. Some reduction in ton-miles of sand and gravel may result from government efforts to curtail long hauls of aggregates; and it is hoped that at least five percent of the beer traffic will be eliminated by restriction of market areas. Savings in the transportation of other commodities such as caustic soda and molasses are negligible as compared with savings which might result from plans for zoning coal now under discussion.

There is also the possibility that orders may be issued by the Office of Defense Transportation further restricting the operations of trucks or coordinating truck and rail carriers, a possibility which has been ignored by this study.

Neither have possible changes in rates authorized by the Interstate Commerce Commission been considered.

Nor has it been possible to weigh fully the indirect effects upon transportation of governmental price and distribution policies. During the coming year many changes in production and marketing controls will be made, some of which will undoubtedly influence the demand for transportation. Limitation orders frequently fail to adjust production to demand: one result is shipments from surplus to deficit areas which transgress normal marketing zones. Rationing and shifts to unrationed items, price controls, and other governmental action, will certainly affect the present pattern of distribution, but the influence of these factors upon ton-miles of freight is hard to measure.

It should be pointed out again that this study applies only to carload shipments. While it is true that these shipments represent more than 90 per cent of rail traffic, changes in trend of less-than-carlot business will likely have a pronounced effect upon ton-miles in 1942. As the result of recent rate actions, less-than-carlot shipments for the past several weeks have risen to last year's levels, and the railroads may acquire a larger portion of this competitive business than they enjoyed last year.

Finally, it should be pointed out that with one exception, these figures are estimates of what the railroads will be called upon to carry; in other words, they are traffic expectations. Only in the case of petroleum and petroleum products has the estimate of tons and ton-miles been based upon the probable capacity of the railroad system. It is possible, indeed probable, that lack of capacity will restrict shipments of wheat, coal, perishables, and other freight and that many movements will be delayed. For there are signs that our capacity to handle freight will be seriously taxed in the last six months of 1943 and in two important sectors--in the West and at the lower end of the Lakes--may perhaps be overburdened.

REVENUE TONS (C.L. Traffic)

The estimate is made that revenue tons of freight originating on Class I carriers in 1943 will be less than 5 per cent above the 1,404 million tons originated in 1942. Specifically, analysis of the individual commodity classes included in the rail classification indicates that revenue tons of freight originated by Class I roads will be approximately 1,436 million tons in 1943, an increase of 2.3 per cent over 1942. This estimate is based upon information received from the Department of Agriculture, the Bureau of Mines, the Office of Price Administration, the Office of Defense Transportation, the War Production Board, other governmental agencies, and industrial associations. The source of information is indicated for each class under discussion in the part of the study entitled Analysis of Railroad Freight Commodities.

Summarizing the various product groups, it may be said that the largest percentage increases take place in anticipated shipments of agricultural and animal products, while a decline estimated at 13 per cent is predicted for products of forests. Practically no change in loadings of mine products is shown in the table and only a 5 per cent increase in the tonnage of manufactures and miscellaneous. The requirements picture by commodity groups is as follows for the three years, 1941, 1942, and 1943. (See Table I for tonnages of individual classes.)

	Group	1941	1942	1943	1943/1942 % Change
I	Products of Agriculture	100,172,666	117,316,390	131,666,000	+12.2
II	Animals and Products	16,810,149	20,619,562	22,634,000	+ 9.8
III	Products of Mines	684,433,639	804,577,132	812,719,000	+ 1.0
IV	Products of Forests	71,539,939	84,570,442	73,316,000	-13.3
V	Manufactures and Miscell.	336,603,030	376,528,328	395,495,000	+ 5.0

Several important assumptions have been made in the computation of the 1943 estimates of originated tonnage which ought to be mentioned.

(1) One of these is an estimated bituminous coal production of 615 million tons. The estimate of the Solid Fuels Administrator is 600 million tons. However, production during the first quarter of this year averaged more than 12 million tons a week, 9 per cent above last year's average for the first quarter. Labor difficulties have interrupted this rate of mining and may reduce operations still further, but if a weekly output of 12million tons can be restored, it is evident that annual production will be substantially in excess of 600 million tons. Although labor conditions are still too unsettled to draw any conclusion on this point, it may well be that the estimate of 405 million tons of bituminous coal to be originated by Class I carriers is too low.

(2) Another major assumption made in this study is that construction will decline by 30 per cent below 1942. This was the estimate of the Building Materials Division, WPB, and of other groups in touch with the construction program. Accordingly, cement shipments have been reduced to 70 per cent of 1942, sand and gravel shipments to 68 per cent of 1942, crushed stone to 65 per cent of 1942; estimated loadings of brick, building tile, furnace slag, artificial stone, roofing and other building materials have been reduced by amounts ranging from 20 to 40 per cent below 1942. Up to this point cement shipments have declined by from 10 to 12 per cent, and shipments of building materials may hold up better than the estimates would indicate.

(3) Class I carriers may well handle greater tonnages of sulfur and phosphate rock than have been estimated. Since the time when these commodities were studied, new efforts have been made to stockpile sulfur, particularly on the West Coast; and the production goal for superphosphate has been increased from 12 to 13 million tons to meet added fertilizer requirements. It is too early to say what the effects of these actions will be.

(4) It is believed that the figure of 116.5 million net tons of iron ore to be moved by rail--assuming 91 million long tons of ore will be carried on the Lakes--needs no correction at this time.

(5) Lumber production and shipments may show decided improvement in the next few months. Despite the fact that carloadings of forest products in the first 17 weeks were 14 per cent below last year, logging and sawmill operations have picked up steadily in the past several weeks. The Office of Defense Transportation estimates an increase in carloadings of forest products for June over the same month of 1942. Continued improvement in this area would make the estimated decrease of 13 per cent in shipments of forest products too extreme.

However, even if the estimated tonnages of coal, sulfur, phosphate rock, building materials, and lumber have to be raised at a later date, the amount to be added to the 1943 estimate would hardly exceed 40 million tons, and the new total of 1,476 million tons would not exceed the 1942 figure by more than 5 per cent.

REVENUE TONS ORIGINATED BY QUARTERS

A quarterly breakdown of the 1943 revenue tonnage estimates was made for the 90-odd classes of freight representing more than 98 per cent of the tonnage carried by Class I roads. The breakdown was made on the basis of the seasonal pattern of previous years, information secured from agencies dealing with the various freight items and reports on first quarter shipments furnished by the Association of American Railroads and by other traffic groups. Comparison was also made with the quarterly estimates of the Regional Shippers Advisory Boards. These quarterly figures have been tabulated and are to be found at the end of the study (Table II).

The classes considered aggregated 1,416 million tons, leaving only 26 million tons of other commodities to be distributed by quarters. The resulting breakdown for 1943, as compared with quarterly shipments of 1941 and 1942, is as follows:

Revenue Tons (C.L. Traffic)

	1941	1942	1943	% change 1943/1942
First quarter	246,691,242	286,556,198	324,000,000	+13.1
Second quarter	287,946,191	358,516,852	371,000,000	+ 3.5
Third quarter	348,311,633	391,259,548	385,000,000	- 1.6
Fourth quarter	326,610,357	367,374,797	356,000,000	- 4.1
Total	1,209,559,423	1,403,707,395	1,436,000,000	+ 2.3

Should the revisions in tonnages of building materials, coal, sulfur, phosphate rock, and lumber discussed above be found necessary, the effect would be to raise the last three quarters of the year. Even with these revisions, however, it is unlikely that the tonnage of carload shipments originated by Class I carriers in the last six months of the year will be very much higher than that originated in the last half of 1942.

REVENUE TONS AND TON-MILES BY COMMODITY GROUPS

Average Haul

No recent and reliable figures on the average haul of particular commodities by Class I roads are available. The only known worksheet on this subject is contained in Appendix A of the Freight Traffic Report of the Federal Coordinator (1934), and covers 1932 traffic. This study found the average haul of all freight originated by Class I railroads to be 352.98 miles.

In the same year (1932), Class I railroads originated 646,223,000 tons of freight and handled 234 billion ton-miles of freight traffic. The ton-mile figure represents hauls of cars originated by Class II and Class III roads as well as of cars terminated by the latter roads. Nevertheless, dividing the tons of originated freight into the ton-miles figure gives a figure of 362.07, only 9 miles higher than the true average haul of tonnage originated by Class I roads. The true figure for average haul of all rail freight is found by dividing ton-miles of all railroads by tonnage originated (or terminated) by all the carriers.

All available statistics indicate a considerable lengthening in average haul in the last 10 years. For 1941 the Commission reported a figure of 368.52 as the average haul for originated tonnage. In the same year, ton-miles of Class I carriers (475 billion) divided by their originated tonnage (1,210 million) came to 392.75 miles, difference of 24 miles from the true average. In 1942, revenue ton-miles divided by tons originated of Class I carriers rose to 454.59, some 62 miles higher than in 1941. Unfortunately, ton-miles of Class II and III railroads are not yet available, so that the true average haul could be calculated.

That the average haul of commodities by rail will increase in 1943 seems certain. More military traffic, the grouping of tonnage of reports, more all-rail coal to New England and the West, a larger number of cars in the East Coast petroleum service, and a marked increase in shipments to the West Coast are but a few of the factors which will push up the average haul figure. Utilizing the estimates of tons and ton-miles made in this study, it may be calculated that average haul for the first quarter jumped to 526 miles, an increase of 72 miles over the first quarter of 1942. This is greater than the seasonal rise occasioned by the absence of shipments of aggregates, ores, and other relatively short-haul commodities.

Revenue Ton-Miles Divided by Revenue Tons Originated, 1941-43

1941	1942	Estimated 1943
410.9	453.8	526.2
358.6	441.6	478.4
380.8	444.3	480.5
403.1	474.1	514.0 1/

1/ It is possible this figure may be even greater if shipments of building materials decline as expected, since the latter are essentially short-haul commodities.

While information on the average haul of individual commodities is meager, it has been possible to construct a table showing average haul of certain commodity groups for 1941, 1942, and 1943. In addition to the statistics reported for 1932 traffic by the Federal Coordinator, the one-day studied of the Office of Defense Transportation, reports of the Association of American Railroads, and data furnished by various Government agencies have been drawn on in an effort to estimate the mileage of rail shipments. It should be remembered that the 1941, 1942, and 1943 figures do not indicate the true average haul but only revenue ton-miles divided by revenue tons originated for Class I railroads. (See table, page 12.)

The commodity classes which comprise the various groups are shown in the Appendix (Table III). For the major freight items such as coal, coke, wheat, iron, and steel products, samples were taken of the cars reported in the ODT one-day studies and an average mileage figure arrived at by estimating road hauls between origin and destination of the cars. The figure for average haul of sand and gravel was arrived at from statistics on the May study furnished by ODT. The average haul of petroleum and petroleum products has been calculated from figures of carloadings and car-miles of these items reported by AAR. At the best, however, many of these averages are just "guesses" and may be from 10-20% away from actuality.

Nevertheless, assuming for the moment that the 1942 estimates of average haul and ton-miles are accurate, the question is: What changes may be expected in 1943? Since it would be exceedingly tedious to discuss individual items or groups of commodities in detail, the most significant changes in average haul of important classes of railway freight will be summarized:

Coal and Coke -- Additional diversion from water to all-rail movement of bituminous coal to New England, Canada, and to Western areas will add to average haul. So will diversion of utility coke from residential to industrial use. On the other hand, more coal will move to the steel industry and to other metallurgical uses; this will tend to reduce the haul. On the whole an increase of 5-10 miles seems to be indicated. This might be reduced by zoning.

Ores -- Two classes, Iron Ore and Mine Products, N.O.S., account for more than 90% of the tonnage of ores. No change expected in iron ore. Lack of shipping on the Lakes may force some limestone used for flux upon the rails (see later discussion of Products of Mines, N.O.S.), and bauxite and aluminum movements may be longer (see discussion of Ores and Concentrates, N.O.S.), but over all there should not be much increase.

Sand, Gravel, and Stone -- Large increase in haul of these aggregates in 1942 because of local shortages and urgency (see Sand and Gravel and Crushed Stone). 1943 construction demands will be lower; field offices have been asked to use local supplies. A reduction of 10 miles has been estimated in average haul.

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REVENUE TONS AND TON-MILES OF CARLOAD FREIGHT, 1941-43

(Class I Carriers)

No.	Commodity Group 1/	Revenue Tons Originated (000) 1941	Revenue Tons Originated (000) 1942	Revenue Tons Originated (000) 1943	Revenue Ton-Miles (000,000) 1941	Revenue Ton-Miles (000,000) 1942	Revenue Ton-Miles (000,000) 1943	Average Haul (miles) 1932 2/	Average Haul (miles) 1941 2/	Average Haul (miles) 1942 3/	Average Haul (miles) 1943 3/
1.	Bulk grain & sugar beets	50,146	58,639	65,523	17,050	21,110	24,244	275	340	360	370
2.	Other cereals	19,813	23,231	27,886	11,194	13,474	16,313	502	565	580	585
3.	Cotton, Hay & tob.	6,140	6,710	6,692	2,917	3,422	3,413	403	475	510	510
4.	Perishables	11,879	13,175	13,931	21,501	24,901	26,330	1,426	1,810	1,890	1,890
5.	Live animals	8,086	9,893	10,900	4,366	5,639	6,322	466	540	570	580
6.	Animal products	6,541	8,233	9,221	7,195	9,221	10,445	953	1,100	1,120	1,125
7.	Misc. farm prod.	22,472	27,083	32,436	11,562	16,791	20,435	421	500	620	630
8.	Coal & coke	419,515	471,166	536,916	146,830	174,331	204,028	319	350	370	380
9.	Ores	158,138	175,466	185,537	37,953	44,744	47,312	195	240	255	255
10.	Sand, stone & gravel	79,168	117,744	78,694	7,283	12,952	7,869	84	92	110	100
11.	Sulfur & sulfuric acid	13,052	14,061	15,910	2,480	3,093	3,500	158	190	220	220
12.	Veg. & an. oils	5,570	6,120	7,407	2,590	2,938	3,718	392	465	480	510
13.	Iron & st. prod.	93,108	106,272	105,587	29,795	38,789	40,123	261	320	365	380
14.	Other metals	4,020	4,484	4,663	4,100	4,663	5,203	920	1,020	1,040	1,040
15.	Petroleum & petr. products	69,323	81,818	87,975	27,729	73,636	95,893	348	400	900	1,090
16.	Forest products	71,047	84,050	72,810	36,944	55,473	48,054	453	525	660	660
17.	Appliances	16,145	14,066	14,685	14,692	13,222	14,098	724	910	940	960
18.	Bldg. materials	37,554	40,950	31,098	11,266	14,333	10,573	234	300	350	340
19.	Mfd. foods	21,742	26,772	27,102	15,980	22,756	23,307	510	735	850	860
20.	Paper & pa. pr.	11,687	12,275	12,110	7,246	8,592	8,477	546	620	700	700
21.	Chemicals	2,275	6,960	12,445	1,422	4,372	10,329	575	625	700	830
22.	Text. & leather	1,010	1,584	1,888	697	1,164	1,407	625	690	735	745
23.	Glass & tile	4,217	4,930	5,414	2,446	2,958	3,248	498	580	600	600
24.	Miscellaneous	72,915	88,005	104,176	49,822	65,004	81,257	479	680	740	780
	Total	1,205,563	1,403,707	1,435,837	475,060	638,068	715,898	Av. 353	Av. 393	Av. 455	Av. 498

1/ As listed in Freight Traffic Report of Federal Coordinator, Appendix A

2/ Reported by the Federal Coordinator

3/ Estimated revenue ton-miles divided by revenue tons originated.

Miscellaneous -- This represents largely one class (Manufactures and Miscellaneous, N.O.S.). In this are grouped military equipment, ordnance, impedimenta. Without question there will be longer movements of these items in 1943. Average haul of feed (see Manufactures and Miscellaneous N.O.S.) will probably increase.

Petroleum and Petroleum Products -- Carloadings and car miles statistics of AAR indicate an average haul of about 400 miles in 1941 and a jump to 900 miles in 1942, resulting from movements into District I. At present average haul is around 1,100 miles, but shorter hauls from new pipeline terminals may bring this down to 1090 for the year.

Forest Products -- Large increase in average haul in 1942 because of diversion of lumber from Panama Canal and pulpwood from coastwise and Lake movements. No change expected in 1943.

Bulk Grain and Sugar Beets -- Greater all-rail haul of grains in 1942 and 1943 because of shortage of Lake carriers and increased requirements. In 1943 sugar beet crop will be smaller; beets are short-haul commodities.

Miscellaneous Farm Products -- Average distance of these products has been lengthened by increased shipments of dried beans and peas and of dried fruit, all long-haul commodities. Diversion of coffee, tea, and cocoa imports from coastwise to land movements, and the fact that these imports will be increased in 1943, will add to haul. Many imported fertilizers are also moving greater distances by rail.

Chemicals -- Largest single item here--explosives--is predominantly long-haul. Remarkable increase in 1942and 1943 shipments.

Appliances -- Increases in volume and distance of shipments of military vehicles and repair parts will tend to lengthen haul.

Iron and Steel Products -- Greater movements of these products to shipyards, to export, and particularly to the West Coast, will add to average mileage.

Perishables -- Diversion from boat increased the average haul in 1942. Traffic shifted from trucks in 1942 was chiefly short-haul. In 1943, further diversion from boat and from truck would tend to lengthen haul, as will recurring market shortages. However, fewer shipments from California and more from Florida are expected to offset any tendency for an increase in average haul.

CAR TURN-AROUND TIME

Turn-around time may be defined as the average number of days between loadings per active car. It is a reflection of the rate of use of cars rather than the volume of work performed per car. Turn-around time is affected by a variety of factors--loading and unloading time, time in transit, empty car movements, to name only a few.

There have been a number of complaints from shippers during the early months of 1943 that turn-around time has increased, and that it is taking more days for cars to reach consignees than in previous years. In particular, shipments to the Pacific Coast were said to require twice as much time to reach their destination as in 1942.

Statistics available on the subject confirm statements that turn-around time, and especially transit time, has been increasing. Carloads of steel plates loaded out of mills in the Pittsburgh area and consigned to shipbuilders in Richmond, California, averaged 17.25 days in transit in January 1943. In January 1942such shipments were received within 10 days in the morning after the date of origination.

Calculations of car performance by the Traffic Section of the Office of Civilian Requirements and by the Office of Defense Transportation indicate that turn-around time as compared with the record of previous years has been increasing since the beginning of the war. These computations are made on an active car basis: that is, the number of surplus and bad-order cars is subtracted from the number of cars on lines of Class I railroads, to determine the quantity of cars in active use. This figure is divided into the number of carloadings in the same week, giving carloads per active car per week. The result is then divided into 7 days and the computed figure is the turn-around time of cars for that period.

A better index of turn-around time is obtained if non-revenue loadings are taken into consideration. All non-revenue loadings are not reported, but the AAR does publish total carloadings of coal, revenue and non-revenue (Form CS-53A). The weekly average coal loadings reported here may be used instead of the revenue loadings of coal reported by the AAR (Form CS-54A). This method of computing turn-around time of car equipment is better for two reasons: (1) It furnishes a more complete picture of car demand; (2) Since the reports of active cars on line include cars engaged in non-revenue service, a more accurate relation of average loadings per active car is achieved. Comparison of the two indices for the first four months of 1943 indicates that the use of average weekly revenue carloadings exaggerates turn-around time by about two-thirds of a day.

Average Turn-Around Time (Days)

	Revenue Loadings	Revenue Loadings and Non-Revenue Coal
January	18.57	17.68
February	17.45	16.53
March	17.34	16.37
April	16.94	16.00

Mr. H. R. Gardner of the Traffic Section, Office of Civilian Requirements, has prepared a table showing turn-around time of revenue and non-revenue cars for the period January 1942-April 1943, which describes in greater detail the method of computation.

Average Total Weekly Carloadings, Carloadings per Active Car
Turn-Around Time per Active Car

1	2	3	4	5
Year & Month	Av. Total Weekly Car-Loadings 1/	Av. Active Cars on Line 2/	Av. Carloading Per Wk. per Act. Car on Line 3/	Av. Turn-Around Time (Days per load) 4/
1942				
Jan.	806,625	1,781,979	.4527	15.46
Feb.	817,721	1,798,328	.4547	15.39
Mar.	833,428	1,812,485	.4598	15.22
Apr.	881,644	1,833,693	.4808	14.56
May	868,568	1,845,917	.4705	14.88
June	887,008	1,834,767	.4834	14.48
July	869,201	1,842,950	.4716	14.84
Aug.	911,684	1,863,388	.4893	14.31
Sept.	916,825	1,885,254	.4863	14.39
Oct.	944,161	1,915,969	.4928	14.20
Nov.	850,246	1,908,850	.4454	15.72
Dec.	746,299	1,887,514	.3954	17.70
1943				
Jan.	743,602	1,877,736	.3960	17.68
Feb.	806,592	1,904,338	.4236	16.53
Mar.	813,685	1,90,3331	.4275	16,37
Apr.	830,159	1,896,893	.4376	16.00

1/ Total revenue carloadings, excluding coal, but including revenue and non-revenue coal, loaded at mines. Source: C.S. - 53A and C.S. - 54A of A.A.R.

2/ Calculated as follows:
1. Cars on line (railroad and private) - average three consecutive reports of A.A.R., form C.S. - 60A
2. Less cars undergoing or awaiting repairs (railroad and private) - average three consecutive reports of A.A.R., form C.S. - 60A
3. Less average daily car surplus (railroad) average weekly figures reported in form C.S. - 54A

3/ Column 2 divided by Column 3

4/ The number of days in a week (7) divided by Column 4.

This table indicates a marked lengthening of the average number of days between loadings for the first third of 1943 as compared with the same period of 1942.

Days Between Loadings of Revenue Freight and Non-Revenue Coal Cars

	1943	1942	% Increase
January	17.7	15.5	14.2
February	16.5	15.4	7.1
March	16.4	15.2	7.9
April	16.0	14.6	9.6

What has caused turn-around time to increase in this fashion? The most frequently heard explanation is that weather conditions were bad, creating congestion in yards and on the line. While this condition may have been true of January, it certainly does not explain the percentage increases registered in February, March, and April.

There is evidence that congestion in yards and along main lines exists independent of weather conditions. A great deal of this congestion is located on western roads, the latest example being the Santa Fe, which at one time had westbound freight backed up to Amarillo, Texas. Insufficient yard and track capacity, inadequate sidings, labor and motive power shortages have resulted in many delays on western roads, particularly in handling the rising tide of cars consigned to the Pacific Coast. Recently the Association of American Railroads placed an embargo upon westbound shipments of other than government traffic until the transcontinental carriers had delivered to eastern connections the large accumulation of empties which had been piling up in their western yards. Some Eastern roads, such as the Pennsylvania, have also showed signs of slowing down on freight deliveries from time to time.

There is reason to believe that heavier loading of cars requires more time for loading and unloading. Despite the efforts of shippers to fill up the cars and of receivers to empty them as quickly as possible, despite demurrage charges and penalties, and despite railroad action to cut down on car detention, the requirement to load cars, especially box cars, more heavily, will increase loading and unloading time. Nor will shortages of labor help the situation.

Another factor tending to increase turn-around time is the constant lengthening of average haul. This has not so important an effect upon running time as it has upon the number of connections and switchings that have to be made. Average haul of carload shipments increased more than 13 per cent in 1942 and for the first quarter of 1943 is estimated nearly 16 per cent above the first quarter of 1942. While this quarter of 1943 is weighted by the volume of petroleum tank car movements to the East Coast, it is certain that average haul for the entire year will be higher than in 1942. (See discussion of Average Haul above.) Consequently, little hope exists that turn-around time for the entire year of 1943 will not be substantially greater than in 1942. This analysis does not consider the possible effects of action to decrease loading and unloading time, or speed up the return of empties.

RAILROAD FREIGHT REQUIREMENTS
BY TYPES OF CAR EQUIPMENT

General

Analysis has been made of the various classes of revenue freight in terms of the types of cars required for their transportation. Tonnages of revenue freight loadings were distributed to car types according to the breakdown reported in the ODT one-day studies, except in the case of one or two commodities where the breakdown appeared to be unrepresentative. In this fashion tonnage requirements were tabulated for box, flat, open top, and covered hoppers, gondolas, refrigerator, stock, tank, and other cars. (Table V shows equipment use by commodity groups.)

This procedure is subject to the following criticisms:

(1) It is assumed that the car uses reported in the one-day studies are a true picture of equipment use. While for the larger classes of freight the picture is probably fairly accurate, it may not be so for lesser freight movements. Inspection of several items reveals some curious car uses: for example,

55 per cent of tomatoes in stock cars on Sept. 28
1-2 per cent of sheep and hogs, double deck in box cars on Sept. 28
Some flat cars loaded with anthracite and bituminous coal
Covered hoppers carrying railroad ties
Pig iron in covered hoppers
1 per cent of the passenger automobiles in hoppers

There is some question whether an increase in coal production is an increase in flat car requirements. Nevertheless, in order to distribute the freight and secure a comparison with 1942, such an assumption had to be made.

(2) Considerable flexibility in car use exists. Gondolas and hoppers may be used almost interchangeably for the transportation of mine products. Shippers will substitute refrigerator and stock cars for box cars and such substitution on the empty back movements of reefers and stock cars has been encouraged. Tank car commodities, e.g., kerosene, may be barreled and shipped in box cars. Shortages of one type of equipment will compel shifts to other types of cars. Where general car shortages exist shippers will take any car they can get.

(3) Changes in the composition of a class make it difficult to estimate equipment requirements. Within the category of Autotrucks are light vehicles which can go in end-door box cars, medium trucks which can go in box cars or gondolas, and heavy trucks which require flat cars. An over-all increase in truck movements gives no information on the relative need for box, gondola, and flat cars.

The myriad items included in Class 701 traveled in the following equipment on May 27 and September 28, 1942: box--80.2 per cent; flat--3 per cent; gondola--7 per cent; hopper--2.15 per cent; refrigerator--1.5 per cent; stock--.1 per cent; tank--6 per cent; other--.05 per cent. It may be taken for granted that there will be substantial increases in military equipment in 1943, requiring additional flat cars and gondolas. On the other hand, the output of many civilian commodities moved in box cars will decline. Consequently, some adjustment for these differences must be made: it was decided to give flat cars 6 per cent of 701 in 1943, gondolas 12 per cent, and reduce box car requirements to 74 per cent of the total, leaving the other percentages unchanged.

(4) The analysis does not take into account car turn-around time. Just as ton-miles is a better index of traffic than tons originated, so car-miles is a better index of car requirements than originated tonnage. Car-days is a better index than either, for it takes into consideration all the factors affecting car use and turn-around time.

(5) Because of differences in loading of cars, tonnage originated will not necessarily indicate the demand for cars. For example, because of loading differences, a 4 per cent increase in box car tonnage may take as many cars as a 6 per cent increase in open-top car tonnage. Heavier loading will tend to reduce carloadings, particularly in box cars.

Despite these defects in procedure, the analysis does throw some light upon the use of cars and car requirements for 1943. In terms of the product groups reported by the Interstate Commerce Commission, car use in 1942 was as follows:

Per Cent of Tons Originated by Product Groups and Car Types (1942)

Type of Car	Products of Agriculture	Animals & Products	Products of Mines	Forest Products	Mfres. & Misc.	Total All Commodities
Box	82.9	19.2	8.0	57.9	51.1	29.0
Flat	.1	(1)	.1	23.6	1.9	2.0
Gondola	5.0	1.5	23.8	16.1	24.0	19.9
Hopper (O.T.)	.6	.1	64.1		1.7	38.5
Hopper (C.T.			.6	(1)	1.6	.6
Refrigerator	11.1	37.2	(1)	(1)	2.0	2.1
Stock	.1	38.7	.1	.4	(1)	.7
Tank	.1	3.3	3.3	.2	15.9	6.7
Other	.1		(1)	.1	(1)	(1)
Total	100.0	100.0	100.0	100.0	100.0	100.0

(1) Less than .05 per cent.

A table indicating more fully the use of equipment by commodity groups for 1941, 1942, and 1943 is shown in the Appendix (Table IV).

The percentage distribution of revenue carload traffic according to equipment use in 1941, 1942, and 1943 has been estimated as follows:

Distribution of Revenue Carload Traffic by Types of Equipment, 1941-43

Type of Car	1941 000 tons	%	1942 000 tons	%	1943 000 tons	%
Box	350,372	29.0	406,827	29.0	423,358	29.5
Flat	25,072	2.1	28,324	2.0	29,194	2.0
Gondola	254,287	21.0	301,663	21.5	285,207	19.9
Hopper (O.T.)	467,413	28.6	531,330	40.0	551,702	38.5
Hopper (C.T.)	9,422	.8	10,438	.7	9,176	.6
Refrigerator	23,675	2.0	28,285	2.0	30,088	2.1
Stock	7,427	.6	9,017	.6	10,073	.7
Tank	71,441	5.9	87,172	6.2	96,481	6.7
Other	450	(1)	557	(1)	552	(1)

(1) Less than .05 per cent.

From these statistics it appears that 60 per cent of all freight traffic moves in open-top cars, nearly 30 per cent in box cars, between 6 and 7 per cent in tank cars, 2 per cent in flat, and 2 per cent in refrigerator cars. Covered hoppers, stock, and all other cars carry less than 1.5 per cent of carload traffic.

BOX CARS

Box cars represent approximately 35 per cent of the cars on U.S. railroads and carry an estimated 29 per cent of all railroad revenue freight. Agricultural commodities and manufactures comprise nearly three-fourths of the tonnage of freight carried by box cars. The remaining box car shipments are made up largely of mine and forest products. It is estimated that in 1942 box cars carried 82.9 per cent of agricultural items, 19.2 per cent of animals and products, only 8 per cent of mine products, 57.9 per cent of forest products, and 51.1 per cent of manufactures.

Revenue tons of carload freight originating in box cars in 1943 are estimated at 423 million, approximately 4 per cent greater than in 1942. The distribution of traffic for the various products groups is estimated as follows:

Commodity Group	Revenue Tons Originated 1941	1942	1943 (est.)
Products of Agriculture	82,018,600	97,325,000	112,597,400
Animals and Products	3,044,100	3,907,600	4,012,400
Products of Mines	57,852,400	64,114,000	66,336,400
Products of Forests	40,582,800	48,926,900	42,359,300
Manufactures & Mixc.	116,873,900	192,493,600	198,952,600
Total	350,371,800	406,827,100	423,358,100
Per Cent Change		+ 16.1	+ 4.1

The additional tonnage to be moved by box car in 1943 will come principally from farm and manufactured products; the greatest increase in requirements occurring in grains and grain products, and in the transportation of explosives. The most significant changes in requirements for box cars of individual commodity classes are listed below. In 1942 these items formed 75 per cent of all freight carried in box cars.

Revenue Tons of Selected Commodities Loaded in Box Cars, 1942 and 1943

(000 tons)

Item	Revenue Tons Originated		
	1942	1943	% increase
Wheat	24,465	33.028	+ 35.0
Corn	17,438	16,391	- 6.0
Oats	3,405	8,916	+ 15.0
Barley & rye	5,363	6,167	+ 15.0
Wheat flour	9,249	12,023	+ 30.0
Mill products, N.O.S. (feed)	10,953	12,596	+ 15.0
Cotton	4,152	4,079	- 1.8
Vegetable oil, cake & meal (except cottonseed)	2,070	3,105	+ 50.0
Products of Agriculture, N.O.S.	8,684	9,471	+ 9.1
Anthracite Coal	3,259	3,553	+ 9.0
Bituminous Coal	20,369	21,719	+ 6.6
Iron Ore	4,123	4,287	+ 4.0
Sand and Gravel	3,951	2,691	- 32.0
Salt	3,594	4,132	+ 15.0
Phosphate Rock	4,334	4,204	- 3.0
Products of Mines, N.O.S.	16,260	17,230	+ 6.0
Lumber	27,857	23,678	- 15.0
Box and Crate Material	2,678	2,678	----
Products of Forests, N.O.S.	2,588	2,484	- 4.0
Refined Petroleum products	4,795	4,555	- 5.0
Sugar	5,373	5,500	+ 5.4
Iron & Steel, 5th Class	11,376	11,945	+ 5.0
Machinery & Boilers	2,353	2,589	+ 10.0
Cement	23,008	16,105	- 3.0
Brick & Building tile	6,590	6,195	- 6.0
Paper Board	3,970	4,525	+ 14.0
Building paper and roofing material	2,546	2,164	+ 15.0
Glass, Bottles, & jars	3,028	3,936	+ 30.0
Manufactures & miscellaneous, N.O.S.	69,274	75,776	+ 18.7
Total	307,105	325,722	+ 6.1

Carloads

While the total tonnage of commodities loaded in box cars is expected to be 4 per cent greater in 1943, the number of cars needed for this tonnage will probably be less. Heavier loading of many box car commodities was attained in 1942 and the number of tons per car for these commodities has been increased by ODT's General Order No. 18, which requires loading to maximum marked or visible capacity except in the cases of specific items. The trend in loadings for major box car commodities is shown in the following table:

Average Loading of Selected Box Car Items by Periods

(tons)

Commodity	1941	1942					
	Year	1st Q.	2nd Q.	3rd Q.	Oct.	Nov.	Dec.
Wheat	46.94	48.41	48.87	50.36	50.01	50.19	50.75
Corn	43.77	45.75	47.29	48.75	48.08	48.42	48.09
Oats	33.37	33.51	35.69	36.22	36.73	36.58	36.65
Barley & rye	41.68	43.11	43.48	44.60	45.09	45.50	45.66
Wheat flour	26.32	27.85	29.98	30.62	30.63	33.71	35.35
Mill products	23,83	24.92	26.72	27.12	27.27	30.82	31.99
Cotton bales	17.96	20.23	20.64	17.64	15.02	17.41	18.38
Cottonseed cake & meal	25.94	25.55	26.23	28.47	29.02	32.06	33.59
Veg. oil cake & meal	26.23	27.38	28.93	30.71	31,42	34.63	35.43
Dried beans & peas	31.77	31.51	33.28	33.72	34.79	38.96	41.43
Prod. of agri.,n.o.s.	29.33	28.64	28.41	30.55	37.80	35.59	33.76
Cured meat	18.23	21.98	24.96	25.99	28.35	28.01	26.41
Wool	14.98	15.78	16.43	17.05	15.51	16.72	16.95
Hides	24.44	26.34	24.70	24.62	26.08	28.91	26.84
Salt	33.92	34.42	35.71	35.23	35.94	39.58	40.17
Lumber	28.33	29.84	29.61	29.90	30.95	32.67	34.06
Box & crate mate.	22.92	23.60	23.40	23,76	24.43	25.72	26.61
Sugar	35.82	34.47	40.30	38.91	42.33	45.21	45.70
Nails & wire	26.57	27.00	29.09	29.55	29.60	31.90	32.37
Cement	39.41	42.08	43.38	45.91	46.42	51.20	52.97
Brick, common	39.46	40.42	42.38	42.06	42.43	44.92	46.38
Lime	31.64	33.72	33.36	35.32	37.12	40.10	42.84
Autos & auto-truck parts	17.64	19.37	20.65	20.53	21.51	22.27	22.68
Printing paper	26.30	27.34	27.84	28.74	28.20	28.81	28.74
Paper bags & wrapping paper	22.93	23.56	24.55	24.85	25.52	29.34	31.12
Glass bottles	17.80	18.22	18.89	18.92	19.20	22.66	19.91
Mfres. & Misc. n.o.s.	21.61	22.42	23.56	23.33	23.71	24.95	25.67

Heavier loading of these and other box car commodities may be expected to continue during 1943, although perhaps not at the rate of increase witnessed in 1942. In all probability fewer box cars will be loaded in 1943 than in 1942.

This should not be taken to mean that there will be a comfortable margin of box car capacity in 1943. Already shortages of plain box cars for wheat have been reported by many of the western carriers. The worst shortages were reported in the middle of March, when large quantities of wheat were being moved to new storage facilities by the Commodity Credit Corporation and farmers were taking advantage of good wheat prices to market last year's crop. No shortages have been reported since April 24.

Box Car Shortages

Week ending	No. of cars
March 13	897
20	1,034
27	437
April 3	249
10	111
17	131
24	105

There is some question as to whether these figures actually reflect shortages. The Association of American Railroads asks member carriers to report car orders that cannot be filled within 48 hours of delivery time asked for. In many cases, however, the railroads use their own judgment as to shortages and the probability exists that more shortages occur than are reported.

The surplus of box cars fell from 39,828 for the week ending January 16 to 15,656 for the week ending March 13, and has since risen to 22,302 for the week ending May 22. Because of heavy grain movements plain box cars were more affected than the auto box, and for the week ending March 13, a surplus of only 12,292 plain box cars was reported. For the first part of 1942, the surplus of all box cars was never less than 20,500, and averaged close to 26,000.

No further shortages are anticipated during the second quarter, and the surplus will probably remain at present levels or increase slightly.

Increased demands for transportation of agricultural products will undoubtedly draw heavily upon the supply of box cars in the last half of the year. A larger number of cars will be needed to meet requirements of mills and alcohol distilleries, feed shipments will be greater than in 1942, and to this traffic will be added fall crop movements. The 1943 crop grain and other crops will probably not be so large as they were last year, but, combined with expected imports of grain from Canada, they should draw heavily upon car surplus.

Among manufactured commodities, movements of cement, lime, and building materials will be lighter in the last half of the year, but this decline will be offset by increased shipments of explosives, truck, tank, and airplane parts, and other military ordnance and equipment. Loadings of forest products are expected to be less than in 1942 throughout the year. The estimated increase in demand for transportation of mine and animal products is not significant.

It is difficult, if not impossible, to estimate the extent to which shortages of other equipment will compel the use of box cars. Analysis of commodity movements on September 28 reveals a much greater use of box cars by animals, mine products, and manufactures than existed on May 27, 1942. Additional shifting from open to closed cars may be expected in 1943, the shift depending upon the extent to which open-top requirements are met from the existing supply of cars.

Ordinarily, box-car turn-around time is less than that of open-top equipment; estimates of the Traffic Section indicate that the average for box cars is from 1 to 1½ days below that of other equipment. This results from the following factors: (1) Average haul of agricultural commodities, building materials, and other box-car items is less than that of other freight; (2) Box cars load lighter, enjoy faster movement than open-top cars; (3) Perishable commodities in box cars are loaded, unloaded with more dispatch and receive preferential treatment by the carriers. However, average haul may be expected to increase for these reasons: increased exports of food products and other items; increase in all-rail haul of grains; greater movements of explosives and ordnance; and larger imports of concentrates, grains, and food. In addition, the tendency previously mentioned of heavier loading to increase turn-around time of car equipment will apply chiefly to box cars.

Summary

No exact appraisal of the demand for box cars has been made in this study for the following reasons:

1. The extent of agricultural requirements in the last half of 1943 cannot be forecast.
2. It is not known to what extent heavier loading in box cars will affect requirements.
3. The extent of shifts of other commodities to box cars cannot be estimated.
4. Insufficient information exists on average haul of box-car commodities and turn-around time of equipment.

In general, it does not appear that there will be such an increase in requirements as to create a general shortage of box cars, although temporary and local shortages may appear when the fall crops are harvested.

FLAT CARS

Flat cars make up a little more than 3 per cent of all freight cars on line domestic railroads and carry only 2 per cent of the total tonnage of revenue freight shipments. Flat cars are of significance in the transportation of only two commodity groups, forest products and manufactures, carrying about 24 per cent of the first group and less than 2per cent of the manufactures. Tonnage carried of other products and product groups is negligible.

It is estimated that in 1943, 29,194,000 tons of revenue freight will be carried by flat cars, an increase of 3 per cent over 1942. The following table shows estimated requirements by commodity groups for 1941, 1942, and 1943.

Revenue Tons Loaded in Flat Cars by Commodity Groups, 1941-43

Commodity Group	Revenue Tons Originated		
	1941	1942	1943 (est.)
Products of Agriculture	107,878	114,940	84,091
Animals and Products	4,122	4,841	4,938
Products of Mines	1,009,969	1,205,196	885,976
Forest Products	17,518,535	19,979,460	17,423,741
Manufactures and Miscellaneous	6,431,776	7,019,353	10,794,857
Total	25,072,280	28,323,790	29,193,603
Per cent change		+ 13.0	+ 3.1

The chief changes in flat car requirements may be easily summarized: (1) Shipments of logs, poles, lumber, and pulpwood will decline from 10 to 16 per cent; (2) Loadings of 5th class steel products, machinery, and boilers will increase from 5 to 10 per cent; (3) Shipments of trucks, jeeps, tanks, and other combat vehicles, heavy guns and other ordnance, will more than double in 1943. The following ten items, representing 89 per cent of the tonnage carried in flat cars, indicate major changes in flat car shipments:

Revenue Tons of Selected Items Carried in Flat Cars

Item	Revenue Tons Originated (000 tons)		
	1942	1943 (est.)	% change
Logs	10,656	9,590	- 10.0
Posts and poles	1,416	1,133	- 20.0
Fuel wood	518	457	- 11.8
Pulpwood (pulp logs)	5,078	4,265	- 16.0
Lumber	1,854	1,576	- 15.0
Iron & steel, 5th class	1,320	1,386	+ 5.0
Machinery & boilers	1,031	1,134	+ 10.0
Tractors & parts	418	408	- 2.4
Autotrucks	385	561	+ 45.6
Manufactures & Misc. (tanks, combat vehicles, guns, etc.)	2,588	6,144	+137.4
Total	25,264	26,654	+ 5.5

Although only a 3 per cent increase in the tonnage of revenue shipments is shown in the calculations, it would be rash to state that this represents a true picture of flat-car requirements. Approximately 2.5 million fewer tons of forest products may be carried in flat cars in 1943, but the consequent release of logging cars in the forests will not necessarily assist in filling requirements for movements of military vehicles and equipment at Detroit and other shipping centers. Many of the logging cars have staked bodies, carry light loads (average for logs is 37.5 tons) and would be unable to handle medium and heavy tanks. For heavy tanks 75-ton flat cars are required, and drop-end gondolas (50-ton) may be used for medium tanks, heavy trucks, and other vehicles.

Only a few shortages of flat cars have been reported to the Association of American Railroads: for the week ending April 17, shortages of 39 cars were reported, for the following week, 37 cars. There have been no shortages reported during May.

Surplus of flat cars has averaged around 1,100 cars for the first months of the year, although for the week ending April 17, only 860 surplus flat cars were reported. For the comparable period of 1942 the surplus varied between 1,600 and 1,900 cars, reaching a low of 1,453 for the week ending April 18, 1942. Sporadic impedimenta movements sometimes draw down flat-car supply in various sections, but usually only for a few days.

Summary

It is estimated that 1,452 new flat cars, almost all of them of the 50-ton type, will be completed and placed in service in the first half of 1943 (up to May 1, 979 had been placed in service), and from 400 to 500 more in the last six months of the year. Despite these additions, it is believed that the surplus of flat-cars will continue to fall:

(1) Logging and sawmill operations show signs of reviving and ODT is estimating about the same number of carloads of forest products for June 1943 as for the same month of last year. Many of the logging cars are not suited for other movements;

(2) Shipments of trucks, military vehicles, and equipment requiring use of flat cars will increase at a rapid rate in the last half of the year; these include impedimenta movements as well as factory shipments;

(3) The declining surplus of gondola cars will make substitution of equipment more difficult;

(4) Average haul and turn-around time of flat cars is certain to increase with the growing volume of military shipments. Shipments of these items to the Pacific Coast will particularly lengthen turn-around time because of the distance involved and congestion in yards and along main lines.

GONDOLA CARS

Gondolas are the most flexible of open-top cars so far as their use is concerned. That is, a greater variety of commodities, especially mine products and manufactures, are carried by gondolas than by any other type of open-top equipment. The most versatile of all freight cars is, of course, the box car. Representing only 17 per cent of the total of domestic freight cars, gondolas carried an estimated 21.5 per cent of the 1942 revenue freight traffic.

On the basis of the assignment of carload freight found in the one-day studies, total tonnage loaded in gondolas in 1943 is estimated as 5.5 per cent less than that originated in 1942. Loadings by commodity groups for 1941, 1942, and 1943 have been calculated as follows:

Revenue Tons of Carload Freight Carried in Gondola Cars, 1941-43 (tons)

Commodity Group	Revenue Tons Originated		
	1941	1942	1943 (est.)
Products of Agriculture	5,491,144	5,812,232	4,136,690
Animals and Products	248,742	299,958	316,898
Products of Mines	153,427,080	191,716,305	172,598,193
Products of Forests	11,710,398	13,589,497	11,754,893
Manufactures & Miscellaneous	83,409,498	90,244,800	96,399,943
Total	254,286,862	301,662,792	285,206,617
Per cent change		+ 18.6	- 5.5

According to these calculations, in 1942 gondola cars were used in the transportation of 23.8 per cent of mine products, 24 per cent of manufactures, 16.1 per cent of forest products, 5 per cent of agricultural commodities and 1.5 per cent of animals and products. The following 24 classes of freight, representing 97 per cent of all gondola loadings in 1942, indicate the major changes which may be expected in revenue tonnage in 1943.

Revenue Tons Originated of Selected Commodities Moving in Gondola Cars, 1942 and 1943

(000 tons)

Item	Revenue Tons Originated		
	1942	1943	% Change
Sugar beets	5,643	3,950	- 30.0
Anthracite coal	1,664	1,814	+ 9.0
Bituminous coal	74,876	79,838	+ 6.6
Coke	3,326	3,625	+ 9.0
Iron ore	13,892	14,446	+ 4.0
Ores & concentrates, N.O.S.	2,127	2,766	+ 30.0
Gravel & sand	57,111	38,835	- 32.0
Stone, broken	21,211	13,775	- 35.1
Stone, rough, N.O.S.	2,039	1,223	- 40.0
Products of mines, N.O.S.	12,512	13,258	+ 6.0
Logs	6,313	5,681	- 10.0
Ties, railroads	1,320	1,056	- 20.0

Revenue Tons Originated of Selected Commodities

Moving in Gondola Cars, 1942 and 1943

(continued)

	1942	1943	% Change
Lumber, shingles & lath	2,439	2,073	- 15.0
Iron; pig	7,184	6,938	- 3.4
Iron & steel--6th Class	10,694	11,015	+ 3.0
Rails, fastening, frogs	2,290	2,290	----
Iron & steel pipe & fittings, N.O.S.	4,522	4,069	- 10.0
Iron & Steel, 5th Class	32,079	33,685	+ 5.0
Machinery & boilers	963	1,059	+ 10.0
Automobiles & autotrucks, N.O.S.	1,432	1,600	+ 11.7
Fertilizers, N.O.S.	2,388	2,579	- 30.0
Furnace slag	3,110	2,496	- 20.0
Scrap iron & steel	17,087	17,087	----
Manufactures & miscellaneous, N.O.S.	6,039	11,264	+ 18.7
Total	292,261	276,422	- 5.4

The extreme flexibility in the use of gondola cars complicates the task of assessing requirements. Gondolas may be used alternately with hoppers to carry coal, iron ore, sand, gravel and stone, fertilizers, furnace slag, and other bulk commodities. They may be substituted for flat cars in any movements except those of heavy tanks, and of logs, poles, and other items too long to be carried by a single car. They may be used for shipments of freight in which box cars figure prominently, such as concentrates and minerals, lumber, iron and steel products, machinery and parts, and civilian and military vehicles. And on September 28, 1942, some cattle and calves were found riding in gondola cars.

During the first quarter the surplus of gondolas dropped from about 8,000 in January, to 3,953 for the week ending March 20, and continued falling in the second quarter, reaching the figure of only 3,121 surplus cars for the week ending May 22. This represents less than 1 per cent of the total number of gondola cars owned by Class I roads. Morover, the surplus often consists of cars unloaded on the West Coast which must be hauled back empty to coal mines and other loading points. During the first five months of 1942 the lowest surplus figure reported was 4,509 for the week ending May 16. Heavier coal movements account for the low surplus figures in 1943.

The Association of American Railroads reports the greatest shortages of gondolas (and of hoppers) during the middle of April. For the week ending April 17, Class I railroads reported shortages of 607 hopper cars and 92 gondolas; for the following week, 26 hoppers and 20 gondolas. No comparable shortages have been reported since that time.

Figures of car shortages at mines have been tabulated by Mr. S. S. Bruce, Assistant Director, Division of Railway Transport, ODT. Until May 1, reports were received only from Southern mines, including the

West Virginia fields, and shortages were figured as the difference between normal daily placement of cars at mines and actual placements. That is, if a mine usually received 100 cars a day, but on April 1 received only 70 cars, a shortage of 30 cars would be reported. It will be remembered that mines are entitled to receive 100% of cars needed for a day's shipment, plus a reserve equal to 75% of daily requirements. The ODT calculations showed an average shortage of 110 cars a day in March, slightly higher in April. Reports from all coal-producing areas of the country were received in May and indicated that the situation was growing worse, especially as the Lake coal movements began to increase. Shortages of cars at mines averaged from 300 to 1300 a day for May. There is some question as to shortage reports by Western railroads, but in any case the figures do indicate an increasing deficiency of coal cars.

Average haul of commodities moving in gondola cars will lengthen noticeably in 1943. Not only will more coal be moving all-rail to New England, Canada, and to the Midwest and Pacific Coast, but military equipment will have to be carried to ports of embarkation and plate and other steel products will have to be shipped to the West Coast. A further point to be remembered is that the progressive decline in shipments of sand, gravel, and stone will eliminate many short-haul gondola movements and add substantially to average haul.

Summary

There is every reason to believe that the situation in regard to gondola cars will deteriorate in 1943. Much will depend upon the resumption of coal mining and the possibility of restoring bituminous production to 12 million tons a week. If full production is attained and the Lake season gets into full swing, shortage of open-top cars will be larger than any previously reported. One factor expected to afford relief for open-top equipment is the decline in sand, gravel, and stone; however, this relief will probably not be significant for some months. Requirements for transportation of sugar beets are expected to be 30 per cent below 1942, so that fewer cars will have to be diverted from other movements to the haul of sugar beets in the last quarter of the year. Turn-around time is expected to increase because of longer movements of coal and military equipment and because of West Coast congestion.

(See the summary on hoppers.)

HOPPER CARS (O.T.)

From the standpoint of the tonnage carried per car, open-top hoppers are the most efficient of all freight cars. While the number of these cars is approximately one-fourth of all cars owned by domestic railroads and private companies, they carry nearly two-fifths of all revenue freight (in 1942, 38 per cent). The reason is, of course, the concentration on heavy-loading bulk commodities. Statistics indicate that hoppers carry 64 per cent of all mine products (the tonnage of mine products exceeds the total of all other commodity groups), less than 2 per cent of the manufactures, and negligible quantities of other product groups.

In terms of the revenue tonnage expected to originate in hopper cars, requirements will be 3.8 per cent higher in 1943, as indicated below:

Revenue Loadings in Hopper Cars by Commodity Groups, 1941-43

Commodity Group	Revenue Tons Originated		
	1941	1942	1943 (est.)
Products of Agriculture	680,600	766,900	678,400
Animals and Products	16,100	18,900	19,300
Products of Mines	454,103,600	515,832,900	537,528,300
Products of Forests	1,210,800	1,465,100	1,242,800
Manufactures & Miscellaneous	11,402,200	13,246,400	12,233,100
Total	467,413,300	531,330,200	551,701,900
Per cent change		+ 13.7	+ 3.8

So far as requirements may be defined in terms of the tons of revenue freight to be originated, the problem for 1943 consists of weighing the increase in coal, coke, ores, and fluxing stone, against the expected decrease in shipments of sand, gravel, and other aggregate materials. This is brought out in the following table of expected changes in the major classes of freight carried in hoppers. These 13 classes of freight represented and estimated 98.6 per cent of all revenue tons loaded in open-top hoppers in 1943.

Revenue Tons Originated of Selected Commodities Moving in Hopper Cars, 1941-43

(000 tons)

Item	Revenue Tons Originated		
	1942	1943 (est.)	% Change
Anthracite coal	64,010	69,779	+ 9.0
Bituminous coal	282,965	301,720	+ 6.6
Coke	17,914	19,527	+ 9.0
Iron ore	93,715	97,452	+ 4.0
Zinc ore and concentrates	1,139	1,253	+ 10.0
Ores and concentrates, N.O.S.	3,099	4,028	+ 30.0
Sand and gravel	14,459	9,832	- 32.0
Crushed stone	15,899	10,325	- 35.1
Products of mines, N.O.S.	20,161	21,363	+ 6.0
Iron & steel, 6th class	1,385	1,427	+ 3.0
Fertilizers	1,345	1,452	+ 8.0
Furnace slag	6,450	5,176	- 20.0
Manufactures & Miscellaneous	1,467	1,536	+ 18.7
Total	524,008	544,870	+ 4.0

Total requirements for hoppers, however, will probably increase more than the 3.8 per cent indicated in the tonnage figures for the reason that average haul of commodities carried in hoppers will be greater. Coal and coke represent more than two-thirds of all hopper freight: as pointed out in the discussion of gondola cars, coal haul will be longer because of Canadian, New England and Western requirements; secondly, further diversion from collier to all-rail movements up the Atlantic Coast will add to ton-miles. Diversion of coke from residential heating to industrial use will result in some unusually long movements for this commodity. It seems unlikely that greater shipments of coal to nearby industries, particularly the steel industry, will be able to offset the forces making for longer coal and coke movements.

Several other factors may operate to extend the average trip of hoppers: (1) the loss of short-haul traffic in sand, gravel, and other aggregates; (2) the possibility of a further increase in the all-rail shipments of iron ore in order to maintain the supply at furnaces; (3) a prospective increase in all-rail movements of fluxing stone.

The general situation as regards hopper cars cannot be regarded as anything but critical. For the week ending May 29, the surplus of hopper cars was reduced to the record low figure of 1,878 cars. This compares with a surplus of 5,250 cars for the week ending May 30, 1942. For the first twenty-two weeks of the year we were a little more than 4 per cent ahead in revenue and non-revenue coal loadings, not quite 5 per cent ahead on coke loadings and nearly 24 per cent behind on iron ore loadings. Cumulatively carloads of revenue ore were nearly 200,000 cars below last year's figure.

Carloadings of Coal, Coke, and Iron Ore
for the First 22 Weeks of 1942 and 1943 1/

	1942	1943	% Change
Revenue and Non-Revenue Coal	3,510,522	3,629,683	+ 4.2
Revenue Coke	847,713	648,655	- 23.5
Revenue Ore	309,869	324,943	+ 4.9
Total	4,668,104	4,603,281	- 1.4

1/ Reported by the Association of American Railroads

Only in the past several weeks have iron ore movements risen to last year's level, and this flow of ore combined with the return flow of coal over the Lakes has strained open-top capacity to the limit. Furthermore, satisfaction of the requirements of 91,000,000 long tons of iron ore and the requirement of nearly 60,000,000 tons of coal to meet the waterborne needs of the Lake territory, would mean that carloadings of coal and ore for the rest of the normal shipping season would have to average 13,000 a week above 1942. Unless unusually good weather keeps the Lakes open later than last year's record season and unless tonnage of other open-top commodities drops sharply, it seems certain that these requirements cannot be met. Already there have been many local and temporary shortages of coal cars; the only reason that no general shortage has occurred is that coal production has been interrupted by strikes. The salient features of the open-top car situation are shown in the following table.

Carloadings of Coal and Ore and Car Surplus for Selected Weeks of 1942 and 1943

Week Ending[1]	Coal Loadings[2]		Revenue Ore Loadings[3]		Surplus of Open Top Cars[3]	
	1942	1943	1942	1943	1942	1943
Jan. 2	171,254	167,551	13,024	13,558	40,986	30,613
Jan. 23	201,980	200,317	14,104	13,559	21,265	26,209
Feb. 13	192,431	220,045	12,920	14,025	24,115	12,475
Mar. 6	182,056	218,825	13,341	13,024	21,344	8,714
Mar. 27	199,017	226,398	30,154	18,279	17,251	6,854
Apr. 17	208,317	216,103	58,257	21,629	15,353	6,361
Apr. 24	208,744	211,378	70,911	35,383	9,978	6,328
May 1	208,397	170,595	78,997	53,391	11,729	10,202
May 8	208,854	182,270	86,800	66,976	10,473	14,882
May 15	210,188	223,560	83,793	76,767	8,810	6,382
May 22	206,219	208,621	87,205	83,989	8,731	5,005
May 29	197,852	193,249	82,886	82,904	9,951	4,925
June 5	203,020		92,453		9,311	
June 12	206,181		86,285		8,929	
June 19	204,766		92,264		8,599	
June 26	209,021		88,167		8,812	
July 3	149,525		85,946		14,115	
July 24	204,675		90,324		10,708	
Aug. 14	209,461		88,424		5,793	
Sep. 4	208,386		85,862		4,725	
Sep. 25	211,288		78,134		4,446	
Oct. 16	207,208		75,807		6,283	
Nov. 6	202,429		67,208		8,474	
Nov. 27	195,439		44,453		14,372	
Dec. 18	204,773		13,855		17,525	

[1] Week ending dates for 1942are one day later than shown.
[2] Revenue and non-revenue coal (AAR CS - 53A).
[3] Reported by the AAR (Form CS - 54A).

Summary of Open-Top Car Prospects

It is estimated by the Office of Defense Transportation that 6,519 gondolas, 9,592 hopper and 2,100 ore cars will be completed for delivery to Class I railroads during the first six months of 1943. In addition 6,615 gondola cars are ahtuorized for delivery in the third quarter of 1943, as part of the original 20,000 car program for the year. Should these be completed on schedule, approximately 25,000 new open-top cars (excluding flat cars) will be placed in service in 1943, not quite 3 per cent of the total ownership of gondolas and hoppers.

In terms of tonnage of loadings, requirements for hoppers are expected to be 4 per cent higher, and for gondolas, 5 per cent lower. However, because of increasing length of haul, revenue ton-miles may very well increase by as much as 10 per cent. Total requirements for open-top cars during the first five months of 1943 were apparently well above requirements for the same period of 1942, judging from statistics of car surplus and mine shortage reports.

Increased production and longer hauls of coal are two of the chief factors affecting requirements for gondolas and hoppers. Although fewer carloads of coal, coke, and ore were loaded in the first 22 weeks of 1943, compared with 1942, surplus of cars was considerably less than in 1942, indicating that turn-around time of open-top cars has increased. Thus far the downward trend in car surplus and the growing trend in car shortages have been arrested by strikes in the mines. There is reason to believe that if coal production in the mines is restored to previous levels and an attempt is made to fill Lake coal requirements, shortages of open-top equipment may become so acute as to curtail mine production.

Offsetting part of the additional requirements for open-top cars will be the anticipated decline in shipments of sand, gravel, and stone. This decline is expected to be greatest in the closing months of 1943 and may provide considerable relief. However, because some construction projects have been delayed and others have suddenly developed, building activity will probably remain at a fairly high level for the remainder of the second quarter and for part of the third quarter. This period should be critical so far as the sufficiency of open-top equipment is concerned. Additional relief for gondolas will derive from the smaller crop of sugar beets to be hauled to mills in the last quarter.

Requirements for hopper cars are expected to be higher than those of other types of open-top cars because of the increased traffic of coal and coke. The greatest scarcity of equipment is in hoppers, and tonnage is being shifted from hoppers to gondolas, causing a dwindling supply of these cars. Additional requirements for transportation of military equipment is also taxing the supply of gondolas. Should an acute shortage of gondolas develop, a shortage of flat cars would speedily follow.

HOPPERS (C. T.)

There are only 8,176 covvered hoppers in the United States (.45 per cent of the total car ownership) and they carry .7 of one percent of all revenue freight. The following table indicates the estimated requirements for covered hoppers in 1943 by commodity groups.

Covered hoppers are used for two main reasons: (1) to protect common certain commodities such as bulk ground cement, lime phosphate, alumina, and other concentrates and oxides from the weather; and (2) to fill the shipper's needs where other cars were lacking. Consequently, some coal, coke, sand, and gravel is moved in this equipment. Changes in requirements for covered hoppers are shown for ten commodities which make up 96 per cent of freight carried in covered hoppers.

Revenue Tons Originated for Selected Commodities Moving in Covered Hoppers, 1942and 1943

(000 tons)

Item	Revenue Tons Originated		
	1942	1943	% Increase
Anthracite coal	416	454	+ 9.0
Bituminous coal	303	324	+ 6.6
Coke	302	315	+ 9.0
Ores & concentrates, N.O.S.	467	607	+ 30.0
Sand and gravel	457	310	- 32.0
Phosphate rock	912	884	- 3.0
Products of mines, N.O.S.	1,266	1,342	+ 6.0
Cement	4,742	3,319	- 30.0
Lime	700	672	- 4.0
Manufactures & mixcellaneous	431	512	+ 18.7
Total	9,996	8,739	- 12.6

These statistics probably do not present an accurate picture of requirements for these reasons: (1) the use of covered hoppers for coal, coke, and sand and gravel is fortuitous; and (2) the fact that three NOS classes of freight are included makes it difficult to separate true covered hopper requirements. The principal items believed to move in covered hoppers and included in these classes are:

Ores & concentrates, nos--alumina, ferro-alloys, zinc oxide, tin concentrate, barium chemicals, gold and silver concentrates.

Products of Mines, nos--alumina, titanox.

Manufactures & Mixcellaneous, nos--ferromanganese, ferrosilicon, ferrovanadium, phosphates, soda ash, sulfate of aluminum.

It is quite likely that the one-day studies do not show a representative sample of commodities carried in covered hoppers, although it is impossible to tell how much of certain commodities move in covered hoppers and what per cent of these commodities move in containers in box cars.

Nevertheless, the table does show in general the expected trend in requirements for covered hoppers. Because of the slump in construction, shipments of cement and lime have declined and will continue to do so. On the other hand, shipments of ferro-alloys will probably be 10 per cent higher, while alumina requirements will increase by at least 80 per cent. According to the size of the individual items reported here, this would mean a 12 per cent decrease in demand in 1943. Last year some cars were taken away from phosphate rock producers and given over to alumina movements, and this year some cars are expected to be withdrawn from cement service.

Longer hauls of this equipment may be expected in 1943 because of rail movements of alumina to Canada and to various centers in the South and Midwest. However, the average haul should not increase to the point that shortages of covered hoppers will result. Moreover, a considerable proportion of the tonnage of commodities believed moving in covered hoppers could move in other ways.

REFRIGERATOR CARS

With approximately 7 per cent of the total number of cars (including privately owned and railroad cars), refrigerator cars handle only 2 per cent of the freight. This low level of performance results from the following factors: (1) Movement of refrigerator cars is highly seasonal and considerable surpluses of equipment exist during off-season periods; (2) Average haul of commodities, carried in refrigerators is unusually long (from 1,100 to 2,000 miles for a major part of the freight) in normal times, and the cars generally return empty; and (3) Loading of refrigerator cars is light, averaging from 12 to 18 tons per car for most commodities.

It is estimated that in 1942 refrigerator cars carried 11 per cent of the tonnage of agricultural commodities, 37 per cent of animals and products, 2 per cent of manufactures, and negligible proportions of forest and mine products. In 1943 it is estimated that requirements, measured in terms of revenue tons originating, will be 6.4 per cent higher than in 1942. Distribution of freight between the various product groups is estimated as follows:

Revenue Tons Loaded in Refrigerator Cars
by Commodity Groups, 1941-43

	Revenue Tons Originated		
Commodity Group	1941	1942	1943
Products of Agriculture	11,658,600	13,027,700	13,882,400
Animals and Products	6,342,400	7,669,300	8,555,400
Products of Mines	21,600	23,800	27,500
Products of Forests	21,000	23,800	23,000
Manufactures & Miscellaneous	5,631,800	7,540,400	7,599,800
Total	23,675,400	28,285,000	30,088,000
Per cent Change		+ 19.5	+ 6.4

Perishable agricultural and animal products compose the bulk of refrigerator car items; revenue ice, beverages, canned food, empty bottles, food, and grains included in Class 701 make up the remainder. In addition, increased use of refrigerator cars, by commodities normally loaded in box cars, has been stressed in the past year, especially in westbound empty refrigerator car movements. The following 28 items, comprising 98 per cent of refrigerator car freight, show major changes in box car requirements for 1943.

Revenue Tons Originated of Selected Commodities
Moving in Refrigerator Cars, 1942 and 1943
(000 tons)

Item	Revenue Tons Originated		
	1942	1943	% Change
Oranges and Grapefruit	2,779	3,328	+ 19.8
Lemons, olives, & citrus fruits, nos	229	271	+ 18.4
Apples, fresh	888	800	- 10.0
Bananas	512	325	- 36.5
Cantaloupes & melons, nos	179	157	- 12.2
Grapes, fresh	442	398	- 10.0
Peaches, fresh	230	267	+ 16.0
Fruits, fresh, domestic, nos	479	470	- 1.9
Potatoes, other than sweet	3,811	4,378	+ 14.9
Cabbage	327	288	- 12.0
Onions	493	468	- 4.9
Tomatoes	288	324	+ 12.5
Vegetables, fresh, nos	1,797	1,707	- 5.0
Fresh meats, nos	3,809	4,189	+ 10.0
Meats, cured, dried, or smoked	730	846	+ 15.8
Butterine & margarine	62	113	+ 79.6
Packinghouse products, nos	891	998	+ 12.0
Poultry, dressed	349	540	+ 54.6
Eggs	398	518	+ 30.0
Butter	498	469	- 5.9
Wool	516	455	- 9.0
Animal Products, nos	410	419	+ 2.0
Beverages	2,406	2,647	+ 10.0
Ice	584	613	+ 5.0
Canned food products, nos	2,753	2,644	- 4.0
Glass, bottles, jars, etc.	336	437	+ 30.0
Manufactures & Miscellaneous, nos	1,294	1,024	+ 18.7
Total	27,671	29,366	+ 6.1

Diversion from truck in the transportation of fresh fruits and vegetables was marked in 1942, averaging 12 per cent in the first three quarters of the year and 17 per cent in the last quarter. Shift of tonnage to the railroads was found in the cases of citrus fruit, potatoes, peaches, tomatoes, meat and poultry, and other agricultural and animal products, much of the tonnage coming off trucks in California and the South, which went into construction and other war work. During the first five months of 1943 diversion continued: truck carlots of citrus from Florida were off 34 per cent and from Texas, off 48 per cent. A lowering of rail rates from Texas accounted for part of this diversion.

Shifts of this traffic to the railroads, large movements of Florida citrus, Maine and Red River potatoes, led to periodic shortages of reefers in the first four months of 1943. A particularly cold winter and scarcity of labor increased difficulties of removing ice from Florida citrus cars in order to bring Maine potatoes down the coast. For part of the Florida movement, ventilated box cars were used. Shortages in potato areas were serious enough so that priority had to be given to movements of seed potatoes. In May, shortages of cars for loading apples in the Pacific Northwest and California and for loading Rio Grande Valley produce were reported. At the present time with the California citrus season under way (size of California orange crop is 85% of last year, lemon crop, 120% of 1942), shortages of reefers have been occurring on the Santa Fe and Southern Pacific. Part of the reason is that these roads are jammed with other freight and are unable to haul empty refrigerator cars from Kansas City to California.

Summary

So far this year periodic local shortages of refrigerator cars have occurred, some of them due to unusual weather conditions. During the second quarter the situation has continued tight. The only relief in sight stems from expectations of reduced fresh shipments of grapes, since more will be dried, fewer crushed for wine or shipped fresh. Heavier loading of citrus and other perishables in reefers has also reduced carload requirements. But spreading tie-ups along western lines, with heavier movements of war traffic and perishables yet to come, presage a deterioration, rather than improvement, in the refrigerator car situation.

STOCK CARS

On May 15, 1943, Class I carriers reported ownership of 53,492 stock cars, of which 10,173 were double-deck, and 43,319 single-deck. With the privately owned cars added in, stock cars represent less than 3 per cent of all cars, carry only .6 of 1 per cent of the traffic. Livestock shipments are seasonal, loading light (8 to 13 tons per car), and movements a little longer than average. During most of the year a considerable surplus of stock cars exists, and in the past year movements of items besides animals in stock cars have been encouraged to relieve the supply of other cars. Since these cars concentrate on livestock movements, they carry 39 per cent of Animals and Products and negligible percentages of other commodity groups. In 1943, a 12per cent increase is expected in tonnage of items carried in stock cars, as indicated in the following table.

Revenue Freight Loaded in Stock Cars, 1941-43

Commodity Group	1941	1942	1943
Products of Agriculture	60,800	71,900	77,200
Animals and Products	6,535,700	7,971,300	9,037,200
Products of Mines	494,300	557,200	594,100
Products of Forests	315,100	385,200	327,100
Manufactures & Miscellaneous	20,800	31,000	37,400
Total	7,426,700	9,016,600	10,073,000
Per cent Change		+ 21.4	+ 11.6

Principal changes in requirements are shown in the following table, which items representing 96 per cent of all tonnage moved in stock cars.

Revenue Tons Originated of Selected Commodities
Moving in Stock Cars, 1942 and 1943
(000 tons)

Item	Revenue Tons Originated		
	1942	1943	% Change
Horses, mules, ponies, and asses	141	141	----
Cattle & Calves - single-deck	4,240	4,813	+ 13.5
Calves - double-deck	78	85	+ 9.5
Sheep & goats, single-deck	142	127	- 10.7
Sheep & goats, double-deck	940	901	- 4.1
Hogs, single-deck	557	600	+ 7.7
Hogs, double-deck	1,848	2,334	+ 26.3
Bituminous coal	493	526	+ 6.6
Pulpwood	250	210	- 16.0
Total	8,689	9,737	+ 12.1

Since animals represent approximately 90 per cent of stock car requirements, their movements are the controlling factor in the stock car situation. Up until this time, livestock movements have not taxed the stock car situation and at this time of year movements are light. Fall shipments of livestock are expected to be heavy, because of the large numbers of animal units on farms and current feed supply. Rail shipments of these units are estimated at 115 per cent of 1942, but may be higher, depending on two factors: (1) Feed supply, and (2) Adequacy of truck facilities.

As regards feed supply, a late season and spring floods have lowered crop estimates and there is certain to be less feed per animal unit than existed at the beginning of the 1943-43 season. Carryover of corn, oats, barley, and other feeds into the 1943-44 season will not assure a comfortable margin of supply, and there is a very good chance that farmers will be compelled to market large numbers of their livestock. In 1942, trucks handled 63 per cent of the weight of livestock received at 68 principal markets, and heavier loading, better routing, and coordinated pick-up service have increased truck efficiency. However, shortages of parts and labor for repairs, a halt in trailer releases, and encouragment of shifting to the rails (to avoid black markets, etc.) will divert a large tonnage from truck to rail. This will particularly affect single-deck shipments of cattle.

Summary

Not only will livestock requirements be at least 15 per cent greater in the fall, but they occur at the peak of traffic and in some areas where railroad capacity is considerably strained, principally the Southwest. Although no numerical shortages of stock cars may exist, movements of war material and the fall peak traffic may create a tight situation at all points west of the Mississippi, particularly along the lines of the Santa Fe and Southern Pacific, and shipments of livestock may have to be delayed.

TANK CARS

Tank cars (all types) represent 7.4 per cent of total freight car ownership and carry a little more than 6 per cent of originated tonnage. Most of the tonnage handled consists of petroleum and petroleum products, vegetable oils and chemicals; that is, of items listed as mine or manufactured products. It is estimated that 15.9 per cent of manufactures, 3.3 per cent of products of mines, and negligible amounts of other product groups were carried in tank cars in 1942.

Requirements for tank cars, measured in tons, increased more than for any other type of car in 1942; that is, by 22 per cent. Measured in ton-miles, however, tank car performance probably doubled, since revenue ton-miles of petroleum and petroleum products (which accounted for more than one-half of all revenue freight in tank cars) increased by 165 per cent. In 1943, further increases in tons and ton-miles of products loaded in tank cars may be foreseen. So far as originated tonnage is concerned, the estimate is for an 11 per cent increase in 1943, as indicated in the table below.

Tons of Revenue Freight Loaded in Tank Cars, 1941-43

	1941	1942	1943
Products of Agriculture	55,800	71,700	78,200
Animals and Products	619,000	687,600	687,900
Products of Mines	13,138,000	26,357,700	29,881,200
Products of Forests	127,500	131,000	127,800
Manufactures & Miscellaneous	57,500,800	59,923,200	65,705,900
Total	71,441,100	87,171,500	96,481,000
Per cent Change		+ 22.0	+ 10.7

Analysis of the tonnage of commodities moving in tank cars indicates that in 1942 petroleum products account for 83.7 per cent of the total; chemicals, paints and minerals, 11.9 per cent; animal and vegetable oils, 2.8 per cent; syrups and molasses, 1.3 per cent; wine, .3 per cent. Twelve items, accounting for 98.2 per cent of all freight carried in tank cars, indicate the major changes expected in 1943.

Revenue Tons Originated of Selected Commodities

Moving in Tank Cars, 1942-1943

(000 tons)

Item	Revenue Tons Originated 1942	 1943	 % Change
Animal Products, N.O.S.	537	547	+ 2.0
Petroleum, crude	21,180	25,416	+ 20.0
Asphalt	4,853	4,125	- 15.0
Petroleum Oils, refined	25,639	24,357	- 5.0
Fuel, road & petroleum, N.O.S.	19,097	22,917	+ 20.0
Lubricating oils & greases	2,154	2,369	+ 10.0
Cottonseed Oil	805	805	----
Vegetable oils, N.O.S.	501	826	+ 64.9
Molasses, black strap & beet rendered	783	392	- 50.0
Alcohol	408	572	+ 40.0
Sulphuric Acid	4,512	6,497	+ 44.0
Manufactures & Miscellaneous, N.O.S.	5,176	6,144	+ 18.7
Total	85,645	94,967	+ 10.8

Most of the additional tonnage to be loaded in tank cars in 1943 will consist of petroleum and petroleum products. As explained in the analysis of individual commodities (see Petroleum Products under Manufactures & Miscellaneous), the increase will result from greater efficiency of tank car operations, shorter hauls from the new pipe lines to refineries and consumption centers, and this increase, as compared with 1942, will be greatest in the first and second quarters. All told, it is estimated that revenue loadings of petroleum and petroleum products will increase 7.5 per cent in 1943. Average haul was 900 miles in 1942, 1119 in the first quarter of 1943, and is estimated at 1090 for the year 1943.

Movements of petroleum tank cars might be greater were it not for expected increases in vegetable oils, alcohol, and chemicals moving in general-purpose cars (Type ICC 103). Vegetable oil production in 1942 was 1,900,000 tons; is estimated at 2,263,000 tons in 1943. This increase is expected to result from greatly expanded output of soybean and peanut oil, and will be greatest in the fourth quarter. Total production of cottonseed, linseed, soybean, peanut, palm, cocoanut, corn, and castor oils by quarters is estimated by the Department of Agriculture as follows:

First Quarter -- 596,000 tons
Second Quarter -- 537,000 tons
Third Quarter -- 442,000 tons
Fourth Quarter -- 688,000 tons

It is evident that additional cars will have to be diverted from other services, principally the petroleum service, in the last quarter of the year, to meet the vegetable oil movement. The fourth quarter will also be highest for the inedible animal oils, the output of which is expected to be from 2 to 5 per cent greater than in 1942 depending upon the number of animals marketed through regular channels during the last six months of the year.

More concern is felt about the adequacy of tank cars to handle the growing volume of alcohol, sulfuric acid, chlorine, pressure gases, and other chemicals which are listed in Class 701, Manufactures and Miscellaneous, N.O.S. The over-all estimate of the increase in loadings of chemicals is 25 per cent, the largest increases for specific classes occurring being Sulfuric Acid--44 per cent above 1942; and Alcohol--40 per cent above 1942.

Alcohol can be carried in ordinary tank cars (Type 103), and presents a problem only insofar as its transportation diverts cars from other services. Total production of alcohol in 1943 is expected to be 57 per cent greater than in 1942, with most of the increase taking place in the output of ethyl alcohol. Because of the efforts of Defense Supplies Corporation to handle as much alcohol by barge and tank truck as possible, it is believed that the railroads will be called upon to carry only part of the increased production. It is estimated that from 40 to 45 per cent of the 1943 alcohol production will be transported by tank car. Consumption of ethyl alcohol will reach a peak of 60 million gallons a month towards the end of 1943, and is expected to be maintained at this rate throughout most of 1944.

A majority of other chemicals require loading in special type tank cars, of which 8,948 were shown to be in existence on October 1, 1942 (from questionnaire prepared by ODT and Stockpile and Transportation, WPB). From the standpoint of volume, sulfuric acid is the most important chemical: tons of sulfuric acid originated by Class I carriers jumped from 2,849,000 in 1941 to 4,632,000 in 1942. As described later (see Sulfuric Acid under Manufactures and Miscellaneous), most of the increase is due to shipment of spent acid to regenerating plants and reshipment to producers of fertilizers and to other consumers. Cars which carry oleum to an ordnance plant leave with a load of spent acid. The acid is carried in ICC 103-A and 103-B cars, which numbered 2,536 on October 1, 1942. The Chemicals Division states that improvements in operating efficiency, withdrawals of cars from other services, and use of Army Ordnance cars have enabled the supply of 103-A and 103-B cars to meet the large increase in transportation of sulfuric acid. Although no complaints have been received from shippers, there is some question whether tank car capacity will be adequate to haul the expected increase of 45-50 per cent in sulfuric acid.

The situation in regard to special type ICC 150-A 300-W cars is more critical. The latter are used for transportation of butadiene, pressure gas for high-octane gasoline manufacture, anhydrous ammonia, and other gases. Requirements for aviation gasoline have increased more rapidly than anticipated, while the synthetic rubber program has not developed as early as expected. Consequently, it has been possible to place 100 of the 250 new butadiene cars in aviation gasoline service. In addition, some 103-A 500-W cars used in chlorine service have been adapted to the handling of pressure gases by changes in valves, and so forth. However, all three programs--chlorine, synthetic rubber, and aviation gasoline--are now increasing. In addition, new anhydrous ammonia capacity is coming into production. More 103-A 300-W cars are urgently needed. The Chemicals Division has recommended building 250 of these cars, but thus far authorization for their construction has not been granted.

Summary

Requirements for tank cars have exceeded supply since the outbreak of war and the progressive decline in the number of tankers in the East Coast petroleum service. The number of tank cars serving District I and the efficiency of operations increased so that tons of petroleum products handled in 1942 throughout the entire country rose 18 per cent, and ton-miles 165 per cent. The estimate is made that in 1943 tons of petroleum products will increase 7.5 per cent and ton-miles, 30 per cent. Despite the expected completion of the War Emergency Pipelines (the 24-inch line to Philadelphia, and the 20-inch line to Norris City), there will probably be a continual shortage of transportation facilities during 1943.

Some diversion of cars from Petroleum service will be necessary to handle vegetable and animal oils during the last quarter of 1943 and first quarter of 1944: vegetable oil production will be 20 per cent higher than in 1943, inedible animal oils, 5 per cent. The alcohol program will probably require from 40-45 per cent more cars than in 1942, although more will go by barge and tank truck. Shortages of special type tank cars are likely to occur, particularly Type ICC 103-A 300-W cars used to haul butadiene, anhydrous ammonia and other pressure gases.

I. PRODUCTS OF AGRICULTURE

An increase of a little over 12 percent in the tonnage of agricultural products handled by the railroads may be expected in 1943. The basis for this estimate is not any foreseeable increase in crop yields, for the harvest this fall will very likely be below that of last year, but is a result of additional requirements for food products at home and abroad.

The plain facts of the case are that approximately the same acreage will be planted this year as in 1942, but a normal yield would make the harvest from 8 to 10 percent below last year's bumper crops. At the same time we shall have to feed from 200 to 235 million people with the food which is normally required by 135 million people. In view of the augmented demands of Lend-Lease and the Military, this can only be done by reduction of home consumption and a drawing upon the considerable stocks, particularly of grains, which have been accumulated as a result of the large harvests of the past several years.

Railroad requirements will follow demand for agricultural products rather than the yield. Particularly it is to be noted that grain and grain products, which with the inclusion of seed, and spent and malted grains * constitute two-thirds of all agricultural products, will increase by one-sixth in 1943, largely because of the necessity for stepping up feed manufacture and the milling of wheat for edible flour and alcohol. Only in the case of corn are grain shipments likely to be lower than in 1942, since a great deal more corn must be fed on farms to the growing numbers of livestock.

Grain imports will undoubtedly be a considerable factor affecting transportation in 1943. Not only will an estimated 50 million bushels of Canadian wheat be imported for milling and export, but present plans call for large movements of barley and oats, either to the Buffalo Mills and New England, or to the Midwest, should it be found necessary to move midwestern grains into the East.

In the case of cotton and tobacco, no important increase is expected in 1943, for the reason that exports of both will probably be lower during the coming year, and because the cotton crop should be from 10 to 13 percent less. Such a decline in the yield of cotton should also involve fewer movements of cotton linters, cottonseed and cottonseed meal and cake. In the case of tobacco, about the same tonnage or little more than last year's tonnage, may be handled by the railroads since acreage allotted to this crop has not been reduced, and the yield is expected to be about the same as in 1942.

Perishables represent approximately 11 percent of agricultural commodities. Most important in this class are the vegetables, with Irish potatoes the largest single item handled by the railroads. Only a 4 percent increase in the crop is expected in 1943 but rail movements may be higher than this because of additional diversion from truck and water hauls. In 1942 the tonnage of potatoes hauled by truck decreased 11.4 percent below 1941. In the case of citrus fruit also, diversion is a prominent factor to be considered in 1943: While the quantity of fruit to be grown is only slightly higher than in 1942, already there are reports which shown that half of the truck shipments of citrus fruit have been shifted to the railroads. An even greater diversion may be expected later in the year. Substantial diversion from trucks to rails occurred in the haul of these fruits and vegetables: peaches, tomatoes and watermelons (and among the unspecified fruits and vegetables).

The supply of dried fruits and vegetables should be somewhat larger this year, largely because of export requirements, but the entire class is relatively small in tonnage and will not prove any burden to the railroads. A more important class of products from the standpoint of tonnage comprises the vegetable oil cakes and meals; these, with the exception of cottonseed cake and meal, will be about 40 percent higher than in 1942, largely because of the rapid expansion in crushing of soybeans and peanuts. Important miscellaneous products are sugar beets, coffee, tea and cocoa, spent and malted grains, fibres, seeds, soybeans and numerous other small commodities. Sugar beet tonnage should be from 25 to 30 percent less this year than in 1942, applying a normal yield to the reduced acreage expected to be planted. In the case of the miscellaneous products of agriculture, an increase in imports of coffee, cocoa and tea and increases in soybeans, in spent and malted grains, and in fibres, will result in an estimated 10 percent increase for this class.

In summation, the tonnage of agricultural products to be handled by the railroads is expected to increase about 14 million tons over the 112 million tons estimated for 1942. The largest single factor in this picture is the anticipated increase in the demand for grains and mill products, particularly wheat and wheat flour. This will have an important bearing upon box car requirements for 1943. With respect to perishables, especially citrus fruit and potatoes, the diversion to the rails may tax refrigerator car capacity during the coming year despite the possibilities of heavier loading.

* These three commodities are listed in the rail classification in Class 164, Products of Agriculture, NOS.

WHEAT

A slight increase in wheat shipments took place in 1942, largely because of unusual shipments during the last quarter of the year. This movement resulted from the efforts of farmers to dispose of the large 1942 crop (981 million bushels, as compared with 943 million in 1941), taking advantage of a good market price for wheat. Indications point to a continuation of this movement in the early months of 1943, creating a shortage in the supply of clean box cars.

Although the wheat crop in 1943 is expected to be more than 20 percent below the 1942 harvest - on the basis of acreage expected to be planted and normal yield, the crop should be approximately 730 million bushels - this will have little effect upon movements, which are expected to be at least 30 percent greater than in 1942. Accounting for this increase are unusually large requirements for milling, both for edible flour and for alcohol flour, and an expanding demand for feed wheat to substitute for other feed grains, especially corn, in which a shortage is being felt on the market.

In addition to the above requirements, the movements of Canadian wheat in the United States, both for export and for milling, must be included.* There are also movements from one bin to another which are handled by the railroads but whose movements cannot be approximated. Total supply, requirements for and estimated shipments of wheat are shown in the following table.

Supply, Utilization and Shipments of Wheat, 1941 - 1943 1/

(In Millions of Bushels)

	1941	1942	Estimated 1943
Supply:			
Stocks on Jan. 1	724.6	1,001.2	1,162.4
Crop	943.1	981.3	730.0
Imports	6.0	1.0	50.0
Total Supply	1,673.7	1,983.5	1,942.4
Utilization:			
Food	494	513	570
Feed	78.3	206.6	296
Seed	64	64	70
Alcohol	.2	13.5	107
Exports	36	24	66
Stocks	1,001.2	1,162.4	833.4
Total	1,673.7	1,983.5	1,942.4
Shipments:			
Milled for flour	485	504	560
Milled for cereals	9	9	10
Alcohol	.2	13.5	107
Exports	36	24	66
Wheat as grain	13	7	1
Wheat as flour	23	17	65
Seed	10	10	11
Feed	0	107 2/	196 3/
Added to stocks in commercial bins and mills	184.5	39	0
Canadian Wheat	43.6	48	49
Exported from U.S.	35	39	40
Milling in bond	8.6	9	9
Total shipments	768.3	754.5	999.0
Shipments (tons)	23,072,000	22,658,000	30,000,000
Percent change		- 1.8	+ 32.4
Rail tonnage	23,469,000	24,575,804	33,177,000
Percent change		+ 4.7	+ 35.0

1/ Table prepared with the assistance of Mr. R. H. Post, Cash Crops Price Analysis Section, Division of Statistical and Historical Research, BAE.

2/ Estimated that 90 million bushels of Commodity Credit wheat and 17 million bushels of other wheat shipped by rail.

3/ Estimated that 171 million bushels of Commodity Credit wheat and 25 million bushels of other wheat will be shipped by rail. This means that the CCC will dispose of 60 million bushels of its 1942 - 1943 allotment, 100 million additional bushels authorized by Congress and will be called upon to sell another 11 million bushels by the end of the year. This expansion in CCC sales appears warranted in view of the unusually large feed requirements in the North Central, Eastern and Southern regions of the country.

* There is some question as to whether we shall actually be able to import 50 million bushels from Canada. There are several questions affecting price which must be settled and the shortage of grain cars may prove to be a bottleneck.

It will be noted that the quantity of feed offered for shipment in 1942 is shown to be less than that shipped in 1941, although the figures of tons originated by rail evidence a small increase. This may be explained by diversion from the Great Lakes as a result of shifting of boats from grain service to ore shipments during the past year. Figures of Great Lakes traffic show that 3 million tons less were carried in 1942 than in 1941. Most of the Great Lakes wheat tonnage has a prior rail haul before it is loaded in boats, but some of this wheat already in bins in Duluth which would ordinarily move by water to Buffalo was moved by rail in 1942. Because of the late opening of the Lakes season some further diversions to rail may be expected.

Further revision of the figures for milling, alcohol manufacture and feed is to be anticipated; but there is certain to be a very great increase in movements of wheat. Carloads should not increase so much as tons loaded because of a continued trend towards heavier loading of wheat.

CORN

The 1942 rail shipments of corn set a new record amounting to approximately 880 million bushels (17 million tons). This represented an increase of approximately 45 percent in corn shipments, as compared with an increase of 18.5 percent in the crop (3.175 billion bushels, as compared with 2.678 billion bushels in 1941). Part of the explanation for the large increase in shipments may be laid to the increase in industrial alcohol requirements and in the whiskey manufacture. But most of the increase which involved more than half of all corn shipments in 1942 was the increase in demand for feed to maintain the expanding numbers of livestock on United States farms. Not only did the Commodity Credit Corporation increase its shipments of corn, but an unusually large amount of corn moved off United States farms to livestock growers in other parts of the country where a shortage of feeds existed, or to commercial, animal and poultry feed mixers, whose business was tremendously increased in 1942. The following table shows the movements of corn from farms, calculated by a similar process to that used in the case of wheat.

Supply, Utilization and Shipments [1] of Corn, 1941 - 1943

(In Millions of Bushels)

	1941	1942	Estimated 1943
Supply:			
Stocks (January 1)	2,031	2,182	2,346
Crop	2,678	3,175	2,850
Imports	1.2	.5	.6
	4,710.2	5,357.5	5,196.6
Utilization:			
Commercial processing	197	250.5	253.6
Seed	16.2	16.5	17
Exports	19	10	5
Feed	2,296	2,634.5	2,886
Stocks (Dec. 31)	2,182	2,346	2,035
	4,710.2	5,357.5	5,196.6
Shipments:			
Dry processing	40	44	46
Wet processing	110.3	130	130
Alcohol	37.2	70	50 [3]
Cereals	9.5	10.5	11.6
Seed	7	9	10
Exports	19	10	5
Feed [2]	354	555.5	483
	577.0	819.0	735.6
Tonnage of shipments	16,162,000	22,940,000	20,605,000
Percent change		+ 41.9	- 10.2
Rail shipments	12,147,597	17,627,890	16,570,000
Percent change		+ 45.1	- 6.0

[1] Prepared with the assistance of Mr. Malcolm Clough, Feed Grains Section, Division of Statistical and Historical Research, BAE.

[2] Feed shipments include Commodity Credit and other commercial sales, excludes feed consumed on farms where grown:

	1941	1942	1943
On farms where grown	1,942	2,071	2,403
Commercial sales	286	464.5	468
Commodity Credit	68	91	15

[3] Ten million bushels sold by Commodity Credit. The remaining 40 million bushels will have to be purchased on the market and this goal may not be reached.

In 1943 little change in the demand for corn for wet or dry processing or for alcohol manufacture is likely to exist. But it is questionable whether the amount of feed corn moving in 1943 will be as great as in the past year. The high price for hogs relative to the price of corn will tend to keep corn on the farms, where it will be fed to the bumper pig crop (estimated at 24 percent higher than 1942). The increased demand for feed in other parts of the country than the Midwest will have to be supplied by wheat and other grains (some of which may have to be imported from Canada). The Commodity Credit Corporation has already sold 30 million bushels from its 125 million bushel program for the crop year 1942-1943, and has already received permission from Congress to sell another 100 million bushels of feed wheat on the market. In addition it is estimated that more than 100 million bushels of wheat will move from the stocks of nearly half a million bushels on farms as of January 1. This grain, supplemented by imports of barley, rye and oats from Canada, will have to supply the increased demand for commercial feed. Moreover, the corn crop in 1943 is forecast at about 10 percent below that of 1942. Despite a slight increase in planted acreage, on the basis of normal yield, the corn crop is set at 2.850 billion bushels as compared with 3.175 billion for the past year's crop.

For the above reasons it is estimated that shipments of corn will be approximately 6 percent lower in 1943.

OATS

Oats is chiefly a feed crop, but is only second to corn in this respect. As in the case of corn, about four-fifths of the crop is normally disposed of as feed and seed on farms where grown. Most of the oats that are sold off farms go into feed, with only a small percentage consumed in the form of cereals.

In 1942 a 15 percent greater crop was harvested (1,359 million bushels as compared with 1,181 million bushels in 1941), but sales are estimated by the Department of Agriculture to have increased only 10 percent, with most of the excess going into stocks on the farms. These sales figures do not reflect accurately the 22 percent increase in rail shipments which is shown by the ICC statistics of originated tonnage.

In 1943 it is believed that the amount going into feed on farms where grown will continue to increase, and this will show a further increase of 15 percent, because of the unusually large livestock requirements. At the same time there are plans to import estimated 40 million bushels from Canada to supplement feed in New England and Lake States. Should this quantity not be imported, some decline in total tonnage of oats shipments might be expected; but on the other hand, additional oats or other feed grains might move from Midwestern farms to make up the deficiency. The total increase in oats offered for shipment is estimated at 11.5 percent. However, as was the case in 1942, rail shipments can be expected to increase more than this figure. It is likely that there has been diversion from trucks to rail in the movement of oats and that this diversion will continue in 1943; in view of these factors a 15 percent increase in shipments of oats has been estimated in 1943.

The following table shows supply, utilization and movements of oats in 1941 through 1943.

Supply, Utilization and Shipments of Oats, 1941 - 1943

(In Millions of Bushels) 1/

	1941	1942	Estimated 1943
Supply:			
Stocks (January 1)	802	761	897
Crop	1,181	1,359	1,180
Imports	6	10	40
	1,989	2,130	2,117
Utilization:			
Cereals	32	35	37
Seed	98	100	100
Feed	1,098	1,098	1,230
Stocks (December 31)	761	897	750
	1,989	2,130	2,117
Shipments:			
Cereals	32	35	37
Feed 2/	190.5	210.5	208 3/
Seed	4.5	4.5	5
Imports	6	10	40
Added to commercial stocks	3	0	0
	236	260	290
Tonnage of shipments	3,776,000	4,160,000	4,640,000
Percent change		+ 10.2	+ 11.5
Rail tonnage	2,848,656	3,473,709	3,995,000
Percent change		+ 21.9	+ 15.0

1/ Table prepared with the assistance of Mr. Malcolm Clough, Feed Grains Section, Division of Statistical and Historical Research, BAE.

2/ Feed shipments determined by deducting cereal, seed sales and additions to commercial stocks from total sales. In 1941, 230 million bushels were sold; in 1942, 250 million.

3/ Of total feed figure of 1,230 million bushels, it is estimated that 1,028 million will be fed on farms where grown, an increase of 15 percent over 1942.

BARLEY AND RYE

Shipments of barley amount to approximately one-third of total crop, while in the case of rye a little more than a half is marketed. In respect to production, rye is about one-eighth as important as barley; in respect to shipments, one-fifth as large.

To estimate the quantities of these two grains moving in 1941 and 1942, figures of sales were utilized. As is shown below, a much greater quantity of barley was used as malt in the production of beer, alcohol and distilled spirits. Larger quantities of rye are constantly going into food, while the amount going into distilled spirits has been reduced to practically nothing.

In 1943, there will be a substantial increase in the number of bushels going into malt for industrial alcohol, and this has forced a curtailment of roughly 7 percent in the amount of malt which may be used for beer. Food requirements for rye are somewhat higher, and it is estimated that unusually large quantities of barley will be used as feed. A large part of the feed barley, however, will be consumed on farms where grown and very little more will move into commercial channels. To supplement the barley and rye available for food, feed and malt production, it is planned to import an estimated 20 million bushels of barley and an estimated 17 million bushels of rye from Canada. Without these importations the quantity of the grains moving in 1943 would not be any larger than it was during the past year; but should the imports materialize as now expected, rail shipments should increase by from 15 to 20 percent. Part of the imports will be by water, but some will move by rail into New England and into the Midwest. In the light of these developments, it is estimated that shipments of barley and rye by rail will be 15 percent greater in 1943.

The following table shows the basis of the estimates which have been made:

Supply, Utilization and Shipments of Barley & Rye, 1941 - 1943

(In Millions of Bushels)

	1941		1942		Estimated 1943	
	Barley	Rye	Barley	Rye	Barley	Rye
Supply:						
Stocks (Jan. 1)	214	42	239	54	290	66
Crop	362	45	426	57	400	50
Imports	2	9	6	0	20	17
Total Supply	578	96	671	111	710	133
Utilization:						
Beer, distilled spirits, alcohol	63 1/	7	80 2/	4	85 3/	0
Seed	28	8	34	8	34	8
Food	4	9	5	9	5	10
Feed	244	18	262	24	346	45
Stocks	239	54	290	66	240	70
Total	578	96	671	111	710	133
Shipments:						
Beer and alcohol	63	7	80	4	85	0
Food	4	9	5	9	5	10
Seed	1.5	4	2	4	2	4
Feed 4/	56.5	5	57	13	58	11
Imports	2	9	6	0	20	17
Total	127	34	150	30	170	42

(Cont'd.)	1941	1942	Estimated 1943
Tonnage (000's)	3,998	4,425	5,252
Percent change		+ 11.0	+ 18.7
Rail tonnage	4,683,641	5,403,598	6,214,000
Percent change		+ 15.4	+ 15.0

1/ Industrial alcohol 672,000 bushels.
2/ Twelve million for industrial alcohol.
3/ Eighteen million bushels for alcohol.
4/ Calculated by deducting other uses from total sales. On a calendar year basis sales are estimated at:

	1941	1942	1943
Barley	125	144	150
Rye	25	30	25

RICE

Nearly all the rice crop is shipped off the farms where it is grown in the southwest California, with the exception of a few million bushels retained for seed. The brown rice moves to mills largely by trucks, and the white rice moves from the mills into channels of consumption chiefly by rail. It requires 162 pounds of brown rice to make 100 pounds of white rice. About half of the finished rice goes into domestic consumption and the rest is exported to Hawaii and now to our forces and Allies overseas. In 1942 rail shipments increased 30 percent because of increased milling and additions to mill stocks. Exports will be considerably increased next year while domestic consumption will be restricted. As detailed in the following table, total shipments and rail shipments of rice are expected to increase by 7 percent.

Supply, Utilization and Shipments of Rice 1941 - 1943

(Million Bushels)

	1941	1942	1943
Supply:			
Stocks, January 1	37.9	32.8	37.8
Crop	51.3	66.6	67.0
Total supply	89.2	99.4	104.8
Utilization:			
Feed and seed	3.7	4.3	4.0
Domestic consumption	26.4	32.0	28.0
Exports 1/	26.3	25.3	35.0
Stocks, December 31	32.8	37.8	37.8
Total utilization	89.2	99.4	104.8
Shipments:			
To rice mills 2/	45.6	62.0	63.0
From rice mills 3/	32.5	35.4	38.9
Total shipments	78.1	97.4	101.9

(Cont'd.)	1941	1942	1943
Tonnage of shipments	1,757,400	2,191,700	2,293,000
Percent increase		+ 24.7	+ 4.6
Rail shipments	819,032	1,064,860	1,139,000
Percent increase		+ 29.9	+ 7.0

1/ Imports of rice are small and are not included. In 1943, 11,000 tons may come in from Mexico.

2/ Calculated by adding domestic consumption and exports and making allowances for changes in mill stocks.

3/ Shipments of white rice estimated by multiplying the sum of domestic and export figures by .617, since 162 bushels of brown rice are required to make 100 bushels of white rice.

GRAIN, NOS

This is a relatively small class of grains consisting largely of buckwheat and popcorn. Tonnage in 1942 increased from 94,000 to 118,000 (25 percent) but it is unlikely that any further increase will take place in 1943. Buckwheat is a catch crop competing with soy beans in many areas where grown. Popcorn competes with wheat, corn and soy beans and early indications point to fewer acres to be planted in popcorn in 1943. It is estimated that both production and rail loadings of these grains will decrease in the neighborhood of 15 percent.

TONNAGE MARKETED AND SHIPPED BY RAIL
BUCKWHEAT, POPCORN & SWEET DRIED CORN, 1941 - 1943

(Short tons)

	1941	1942	1943
Sales:			
Buckwheat 1/	54,400	60,242	55,000
Popcorn 2/	60,912	76,638	60,000
	114,300	136,880	115,000
Percent increase in Sales		+ 19.8	- 16.0
Rail loadings	94,100	117,788	100,000
Percent increase		+ 25.2	- 15.1

1/ Normally 30 percent of buckwheat crop is sold off farms.

2/ Practically all popcorn sold off farms.

WHEAT FLOUR

The quantity of wheat flour to be produced may be measured by the number of bushels of wheat required for the manufacture of edible and alcohol flour. Very large increases in the amount of flour for Lend-Lease and the Military is indicated in 1943. The Department of Agriculture estimates that about four times as much flour will be consumed by these claimants as in 1942. At the same time domestic consumption of flour may be greater because of the curtailment of other foods, and at the present time requirements for alcohol manufacture call for the consumption of 77 million bushels, although this figure may later be changed. These requirements are summarized in the following table:

Estimated Requirements and Rail Shipments of Wheat Flour, 1941 - 1943

	1941	1942	Estimated 1943
Wheat requirements (Millions of bushels)	508	521	702.5
Domestic flour	485	504	560.0
Export flour	23	17	65.0
Alcohol	-	-	77.0 1/
Barrels of flour (millions)	105.5 2/	112.4 2/	149.5 3/
Tonnage of flour (thousands)	10,343 2/	11,020 2/	14,650 4/
Percent change		+ 6.5	+ 32.9
Rail tonnage (thousands)	8,708	9,257	12,034
Percent change		+ 6.3	+ 30.0

1/ Estimated that 30 million bushels will go directly to alcohol, 77 into flour for alcohol.

2/ Reported by Bureau of Census.

3/ On basis 4.7 bushels of wheat for 1 barrel of flour. The ratio may actually be reduced to 4.6 bushel wheat to 1 barrel of flour.

4/ Estimated on basis one barrel of flour equal to 196 pounds.

This represents a very great increase in the volume of flour production and shipments. There is a question whether the flour mills can actually turn out this quantity of flour. In December the mills processed 48,850,000 bushels and were operating at about 78.5 percent of capacity. This indicates that only a 27 percent increase in milling would be possible before capacity was reached, but members of the Feed Grains Section in the Bureau of Agricultural Economics believe that a rate of milling higher than this may be obtained since the present estimate of capacity is based upon a single 8-hour shift. However, not all the increased production of the alcohol flour will require shipment; consequently the figure for the expected increase in rail shipments has been placed at 30 percent.

CORNMEAL

Cornmeal represents a relatively small item, amounting to a little over 200,000 tons in 1942. Although no figures on cornmeal production have been published since 1939, the Department of Agriculture estimates that approximately 40 million bushels of corn were used in dry processing in 1941, and 44 million in 1942, to make cornmeal and flour. In 1943 it is estimated that there will be an increased use of cornmeal because of deficiencies in other foods, and it has been assumed that 42 million bushels of corn will be dry processed. Consequently, a 5 or 6 percent increase in this class is indicated.

Production and Rail Shipments of Cornmeal, 1941 - 1943

	1941	1942	Estimated 1943
Number of bushels of corn dry processed 1/	40	44	46
Estimated production of cornmeal (tons) 2/	872,000	959,000	1,007
Percent increase		+ 10.0	+ 5.0
Rail tonnage	188,438	217,375	230,000
Percent increase		+ 15.4	+ 6.0

1/ Estimated.

2/ On basis 4.5 bushels of corn to one barrel of meal. Less than 1 percent of this figure is represented by corn flour.

FLOUR AND MEAL, EDIBLE, NOS

This class consists largely of buckwheat flour, soybean flour, rice flour, prepared flour and a small tonnage of corn flour. In 1939 the following tonnages of flour were reported by the Census Bureau:

Buckwheat flour	11,320 tons
Rye flour	715 "
Rice, malt & soybean flour	18,020 "
Prepared flour	71,800 "
Corn flour	159 "

In 1942 an increase of 18.7 percent was registered by this class, due, it is believed, to the increase in rye, buckwheat and soybean flour. In 1943 it is estimated that the buckwheat flour will remain at about the same level, the prepared flours will increase by about 5 percent, while the rice, malt, and soybean flours will increase in the neighborhood of 50 percent, the largest increase being made in the output of soybean flour. The table below shows that a 9 percent increase in these flours may be expected in 1943. A rough 10 percent increase in this class has been estimated in the summary tables.

Estimated Increase in Production & Shipments of Edible Flour and Meal, NOS

	1942 Weight 1/	Percent Increase	1943 Weight
Prepared flour	71	+ 5	72
Rice, malt & soybean flour	18	+ 50	27
Buckwheat flour	10	-	10
Rye & corn flour	- 2/	-	-
	100		109
Percent change			+ 9

1/ Based upon 1939 Census tabulation.

2/ Less than .1 percent. A large increase in rye flour is estimated for 1943, but the total will not be significant.

CEREAL FOOD PREPARATIONS, EDIBLE, NOS

The most important grains used in the manufacture of cereal foods are oats, corn and wheat, with oats representing nearly half of all prepared cereal ingredients. No data on the output of the cereal foods have been made since the 1939 Census tabulation, but estimates have been made by members of the Division of Historical and Statistical Research, BAE, of the number of bushels of wheat, corn and oats going into cereal manufacture. The table below shows that their estimates for 1942 are closely related to the changes in originated tonnage of cereal foods since 1939.

Tonnage of Cereal Food Preparations, 1939 and 1942

	1939 (Tons)	Percent	Estimated 1942 (tons)	Percent
Wheat	226,500	35.2	230,000	29.9
Corn	115,200	17.9	177,000	23.1
Oats	274,600	42.6	326,000	42.4
Other grains	28,000	4.3	35,000	4.6
Total	644,300	100.0	768,000	100.0
Percent change			+ 19.2	
Tons originated*	829,773		980,046	
Percent change			+ 18.1	

* Increase in originated tonnage due chiefly to weight of containers.

In 1943 it is estimated that 36 million bushels of oats, 11.6 million bushels of corn, and 10 million bushels of wheat will be consumed in cereal production. The recovery of the prepared cereals is approximately 85 percent for wheat and between 55 and 60 percent for corn and oats. On this basis it may be calculated that the tonnage of prepared cereals will approximate 832,000 tons, an increase of 8.4 percent. A 10 percent increase in loadings of prepared cereals has been estimated in the rail figures, as shown in the table below.

Volume and Rail Tonnage of Principal Grains Involved In Cereal Manufacture, 1941 - 1943

(In Millions of Bushels)

	1941	1942	Estimated 1943
Oats	32	34	36.0
Corn	9.5	10.5	11.6
Wheat	9	9	10.0
	50.5	53.5	57.6
Estimated tonnage of grains	1,048,000	1,108,000	1,201,227
Estimated tonnage of cereals	727,000	768,000	832,000
Percent change		+ 5.7	+ 8.4
Rail tonnage of prepared cereals	892,066	980,046	1,078,000
Percent change		+ 9.9	+ 10.0

MILL PRODUCTS, NOS

The commodities listed in this class represent by-products of flour and cereal manufactured which go into commercial feed market. Most of the items result from the processing of wheat and corn, especially the latter which in the last two years has accounted for approximately more than half of all commercial feed ingredients. The mill products in this class move from the flour mills by rail to mixed feed manufacturers located at various points over the country. After being prepared as poultry and animal feed, they move in package form to distributors (animal and poultry feed in 1942 according to the ODT one-day studies, was the largest single item in Class 701). More than 60 percent of the mixed feeds production is in the form of poultry mashes and scratch feeds, while most of the remainder is fed to dairy cattle. Some of the mixed feeds find their way to other livestock raisers but the percentage is not significant. In 1943 no increase is expected in the numbers of dairy cattle on farms, but latest reports show a 15 percent increase in the numbers of poultry flocks on farms (in January there were 423,000,000 layers compared with 368,000,000 in January 1942). Farmers report intention of purchasing 16 percent more baby chicks than last year. An equally important factor is the relation of farm income to feed prices: in the early months of 1943 egg prices were 25 percent higher than during the same period last year, while feed was only 15 percent higher than a year ago. A similar situation exists for dairy farmers. In view of these factors, a 15 percent increase in feed requirements may be regarded as conservative.

The following table shows the breakdown of estimated change in Class 61, Mill Products, NOS. In general, the feed constituents derived from wheat - bran, middlings, screenings and shorts - are expected to increase from 30 to 35 percent, while corn ingredients - cracked corn, grits and hominy - will be slightly lower. Gluten feed is estimated at 975,000 tons as compared with 976,000 tons in 1942 = practically no change. Other changes explained in footnotes.

Breakdown and Estimated Increase in Shipments
of Mill Products, NOS

Item	1942 Weight 1/	Percent Increase	1943 Weight
Bran	10.5	+ 35	14.2
Cracked corn	2.5	- 6	2.3
Gluten feed and meal	11.0	-	11.0
Feed, noibn	39.1	+ 15 2/	45.0
Grits	4.7	- 6	4.4
Hominy	2.2	- 6	2.1
Alfalfa meal	9.4	- 9 3/	8.6
Middlings	7.7	+ 35	10.4
Screenings	2.6	+ 35	3.5
Shorts	6.6	+ 35	8.9
Oatmeal feedings	2.5	+ 15 4/	2.9
Other	1.2	-	1.2
	100.0		114.5

1/ Calculated on the basis of average weight of individual items shown in the ODT one-way studies.

2/ Increase predicated upon 15 percent increase in poultry on farms and higher farm income relative to the price of feed.

3/ Alfalfa crop expected to be lower in 1943. Only shipments to the Army should increase.

4/ Corresponds with the increase in shipments of oats.

As far as the grains which may enter the commercial market as feed are concerned, a similar increase is to be expected. This feed grain will be required by livestock growers in the North-Central region and by poultry and dairy farmers in New England and the South. On the basis of the foregoing tables showing feed, wheat, corn, oats, barley and rye, the following quantities are available.

Estimated Quantities of Grains Consumed as Feed 1/
1942 and 1943 - Millions of Bushels

	1942	1943
Wheat	107	215
Corn	537	483
Barley 2/	57	78
Rye 2/	9	21
Oats 2/	211	248
Total	921	1,045

1/ Except on farms where grown.
2/ Assumed that imports are used as feed or go to other uses which release an equivalent amount of the crop

This shows that an increase of 13.5 percent in the quantity of feed in the commercial market may be expected. Quite possibly this may not be sufficient to meet requirements and additional quantities of the various grains may have to be imported, sold by Commodity Credit Corporation or brought into the market. So far as rail shipments are concerned a 15 percent increase would raise the tonnage originated from 11 million tons in 1942 to 12.7 million tons during the current year.

HAY AND ALFALFA

While production of hay and alfalfa increased by about 12 percent in 1942 over 1941, rail movements went up by 40 percent chiefly, it is believed, as a result of a greatly increased demand by the Army and increased packaging requirements. Normally about 10 million tons of hay are sold (one-eighth of the total 1940 and 1941 crop) but over 90 percent of this hay is used locally and does not involve a rail movement. However, Army purchases particularly for the maintenance of animal units in the Southwest, do normally move by rail and so do large quantities of hay and alfalfa used for packaging.

Colonel Daniels, Chief of the Remount Division, Quartermaster Corps, U.S.A., believes that approximately the same number of animals will be maintained by the Army in 1943 as in 1942. This would involve a small increase in Army consumption. Packaging requirements will also be higher in 1943, especially if insufficient wood is available for boxes and crates. Although the crop estimate for 1943 shows a 10 percent decline in the production of hay and alfalfa, sales will probably be maintained and may even increase if the demand for hay in the market is greater. Consideration of Army and packaging requirements warrants the conclusion that the tonnage of hay loaded by Class I carriers may rise to 900,000 tons, a 17.8 percent increase.

Production and Rail Shipments of Hay and Alfalfa, 1941 - 1943

(Short Tons)

	1941	1942	Estimated 1943
Production of hay and alfalfa	94,238,000	105,328,000	94,500,000
Percent change		+ 11.7	- 10.3
Sales	10,329,000	12,306,000	
Percent change		+ 19.1	
Rail tonnage	545,847	764,105	900,000
Percent change		+ 40.2	+ 17.8

STRAW

Tonnage of straw carried by Class I railroads amounted to 317,000, an increase of 9 percent over 1941. Very little information on straw is available but it is believed that this increase was due to a greater demand of straw for feed and for strawboard manufacture. Most of the strawboard mills are located in areas where the crop is grown and receive the majority of their shipments by truck. Quarterly figures for 1942 reveal a considerable increase over 1941 in the early months of the year, and a decrease below 1941 in the last two quarters. It seems hardly likely that shipments of straw will be any greater in 1943, and no increase in the production of strawboard is anticipated. Consequently, tonnage of straw to be originated by the carriers in 1943 is set at 320,000 tons, representing a one percent increase.

TOBACCO

In 1942 the tobacco crop was approximately 12 percent higher than in the previous year, while rail tonnage figures were only 6.4 percent greater than in 1941. Although the various movements of tobacco are complex and difficult to trace, it seems reasonable to suppose that the rail shipment figures were affected by a decline in imports and in exports of leaf tobacco. The following table shows production, exports, imports and rail shipments of tobacco, 1941 - 1943.

Production, Imports, Exports and Rail Tonnage of Tobacco, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production 1/	632,000	708,000	711,000
Exports	134,879	118,764	115,000
Imports	38,329 2/	6,758	5,000
Total	805,208	833,522	831,000
Percent change		+ 3.5	- .3
Rail tonnage	733,284	742,616	730,000
Percent change		+ 1.2	- 1.7

1/ Includes flue-cured, burley and other domestic tobaccos.

2/ Imports for consumption only.

Tobacco is usually shipped from farm to market by wagon and truck. It then goes from market to drying plants by truck and rail. Much of the flue-cured tobacco from Georgia and South Carolina, and a large part of the air-cured tobacco from Kentucky is railed to various fabricating centers and storage points. Since a majority of the export tobacco now comes out of storage, it is believed that the inclusion of the export tonnage with production is not without justification. It will be noted that the amount of tobacco now being exported is far below one-third of the crop which normally went abroad in the 1930's.

Despite the increase in acreage allotment for tobacco from roughly 1,400,000 acres to a little over 1,500,000, on the basis of a 10-year average yield, the crop should not be very much greater this year. On the basis of last year's trend, and assuming some diversion from truck to rail, an increase of 2.6 percent in the rail tonnage may be forecast.

COTTON

An unusually large crop of cotton was produced in 1942, 12,980 thousand bales as compared with 10,740 thousand bales in 1941. This represents an increase of nearly 21 percent in the estimated number of bales and is considerably larger than the increase in tonnage originated by Class I carriers (8 percent). The principal reasons for the failure of rail traffic in cotton to match the production increase are: (1) The 1942 crop was relatively short fibre cotton and part of it was not ginned and shipped during the year. (2) A large part of the 1942 bales will not move until 1943. (3) A considerable decline in exports took place.

It will be noted that the rail tonnage figures exceed the weight of the crop by from 20 to 40 percent, a difference that can only be accounted for by our shipment of cotton at various points in the country. Nearly all the cotton moving from farms to gins goes by truck, but thereafter several movements of cotton by rail are possible: (1) The cotton bales may go from the gin by rail or truck to a warehouse or shipping point. (2) Cotton may be moved to export - all-rail to Canada or rail and water to other foreign countries. (3) The cotton may move directly to a mill. (4) The cotton may move by rail and water from the Gulf and Southern Ports to North Atlantic ports and to New England. Most than one million bales were involved in this latter movement during the crop year 1939 - 1940; it may be assumed that this traffic has been converted from a rail-water haul to an all-rail haul in the past 15 months. But this diversion would probably not affect revenue tons originated substantially, since the cotton has in most cases been previously handled by rail.

Some old cotton is moved from one warehouse to another to make room for the new crop; this was true of CCC cotton in the years preceding 1941 when the crop was much in excess of requirements for consumption or for export. The following table shows the production, major movements and the rail shipments of cotton, 1941 - 1943.

Production, Disposition and Shipments of Cotton, 1941 - 1943

	1941	1942	Estimated 1943
Production (000 bales)	10,744	12,982	12,200
Production (tons) 1/	2,750,500	3,323,400	3,123,200
Percent change		+ 20.8	- 6.0
Disposition (tons) 1/			
Consumed at the mills 2/	2,626,600	2,923,000	2,777,000
Added to mill stocks 2/	142,900	44,000	40,000
Exports 3/	312,460	269,119	270,000
Total	3,081,960	3,236,119	3,087,000
Percent change		+ 5.0	- 4.6
Rail tonnage	3,864,000	4,173,127	4,100,000
Percent change		+ 8.0	- 1.8

(Footnotes on following page.)

1/ Using 512 lbs. as average weight of bales of domestic cotton.

2/ Includes foreign cotton.

3/ Using 527 lbs. as average weight of bales of cotton for export.

Originally the Department of Agriculture curtailed the cotton acreage from 24 million acres to 22.5 million acres; on the basis of a normal yield this would have meant a reduction of 13 percent from the bumper crop of 1942. Subsequently, Secretary Wickard announced that there would be an estimated 10 percent expansion in the acreage goal, but cotton experts in the Department feel that this will not necessarily mean a 10 percent increase in crop expectancy, since it will be impossible to increase production in many areas of the Southeast. A 6 percent decline in cotton production seems more reasonable. Because of the carry-over of the 1942 crop into the current year, it is not believed that revenue tonnage will decline to this extent. It is estimated that the tonnage of cotton handled by Class I railroads will be only slightly lower in 1943.(- 1.8 percent).

COTTON-LINTERS, NOILS AND REGINS

Cotton linters, noils and regins are produced from a reginning of fibre remaining on the cotton seed after the first ginning and therefore tends to follow the same trend as bales of cotton. From the 1941 crop 1,184,000 bales of cotton linters were produced; and from the 1942 crop, 1,350,000 bales. Consumption, however, did not follow the production trend because of the use of stocks of linter bales in 1941 and in 1942 and because in 1941 linters were permitted to be consumed in mattress production. (In 1942 linters were restricted to use in the manufacture of explosives.) Consequently, consumption of cotton linters decreased slightly in 1942 and this corresponds closely with the trend in rail shipments.

It will be noted that tonnage of rail shipments exceeds tonnage of bales produced and this is to be accounted for by the factor of reshipping from warehouses and concentration points, and because the small tonnage of noils and regins would add somewhat to the linters figure (see table below). It is expected that the number of bales of cotton linters available in 1943 will drop off because of a smaller crop. At the present rate of consumption it is estimated that 1,300,000 bales will be processed in 1943. Consequently, the rail tonnage figure has been decreased by 10 percent.

Consumption and Rail Shipments of Cotton Linters, 1941 - 1943

	1941	1942	Estimated 1943
Consumption of linters (bales)	1,473,000	1,447,000	1,300,000
Consumption of linters (tons)	463,200	455,030	408,800
Percent change		- 1.8	- 10.2
Rail tonnage	707,107	713,694	642,000
Percent change		+ .8	- 10.0

COTTONSEED

In 1942 the tonnage of cottonseed originated by Class I carriers increased a little more than 20 percent, closely corresponding with the increase in the production of cotton (12,980,000 bushels as compared with 10,744,000 bushels in 1941). As indicated in the table below, the railroads carry normally less than one-eighth of the crop. Most of the cottonseed moves from the gins to the crushers in trucks over relatively short distances. A check on receipts of cottonseed at crushers shows that 4,563,000 tons were received in 1942 compared with 4,382,000 tons in 1941 (a 4 percent increase). This indicates that in the actual movement of the seed there was some diversion from truck to rail, a factor prevalent in the shipment of many commodities in the South because of the use of trucks in construction work.

The cotton crop is expected to be from 5 to 10 percent smaller in 1943, and cottonseed oil production has been estimated at 95 percent of the 1942 production, indicating that total shipments of cottonseed will be diminished. Should the agricultural trucks return from construction work to their normal hauls rail shipments will be lowered further. In any case there should be a decline in rail tons of cottonseed originated, and this decline has been conservatively estimated at 5 percent.

Production and Rail Shipments of Cottonseed, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production 1/	4,770,000	5,764,000	5,384,000
Percent change		+ 20.8	- 7.6
Rail tonnage	548,425	671,431	638,000
Percent change		+ 22.4	- 5.0

1/ On basis .444 tons of cottonseed per bale of cotton.

COTTONSEED, MEAL AND CAKE

While the production of cottonseed meal and cake increased only 2 percent in 1942 - 1,958,000 tons as compared to 1,922,000 tons in 1941 - rail tonnage of the cake and meal originated went up more than 40 percent. It is believed that the difference can be largely accounted for by unusual shipments out of stock in 1942: as shown below stocks declined approximately 290,000 tons between January 1st and December 31st. Even with this change in inventories taken into consideration, however, the rail tonnage increased at a faster rate than shipments, indicating that diversion from truck figured in the movement of this commodity as well as many other products which originate in the South. The percentage of cake and meal hauled by railroads in 1941 was 52.8 percent and in 1942 it was 58.1 percent.

It is estimated by the Department of Agriculture that there will be a reduction in the amount of cottonseed oil and cottonseed cake and meal produced in 1943. This estimate is based largely upon an expected reduction in the crop during the latter months of the year when most of the seed is crushed. However, because present stocks are rather low it will be impossible for as much cake and meal to be shipped out of stock in 1943 as in 1942. A calculation shown below reveals that cottonseed shipments should decline by an eighth during the coming year. However, further diversion from trucks may take place increasing the rail portion of total shipments. On this basis the 1943 loadings are placed at 94 percent of the 1942 figure.

Production, Shipments & Rail Tonnage of Cottonseed Meal & Cake. 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production:	1,930,000	1,958,000	1,900,000
Stocks, January 1	170,554	380,593	92,172
Total supply	2,100,554	2,338,593	1,992,172
Stocks, December 31	380,593	92,672	30,000
Shipments	1,719,961	2,245,921	1,962,172
Percent change		+ 30.6	- 12.6
Rail tonnage	908,274	1,305,752	1,227,000
Percent change		+ 43.7	- 6.0

ORANGES AND GRAPEFRUIT

In 1942 while total production of oranges and grapefruit increased 7.5 percent and total shipments a little over 4 percent, the tonnage of oranges and grapefruit carried by the railroads increased more than 22 percent. The reason for this is to be found in a considerable diversion from trucks, particularly in shipments of citrus fruit from Florida, Texas and Louisiana. Many of the trucks ordinarily engaged in carrying citrus fruits were shifted to other uses, particularly construction work. While no comprehensive figures on intercity truck shipments of citrus fruit are available, preliminary indications show that there was a 25 percent decline in citrus fruit trucking in 1942. A small tonnage of oranges and grapefruit normally shipped by boat from Florida was diverted to the railroads.

The California Fruit Growers Exchange reports that their trucks carried 31 percent fewer boxes of oranges and grapefruit during the 1941-1942 season than in the previous season. The decline in truck shipments was particularly noticeable in the last quarter of 1942 and has continued over into the present year. In the first quarter of 1943 truck shipments from Florida showed a decline of 40 percent, from Texas 54 percent, and from Arizona 50 percent. It is not likely that this diversion of trucks will hold for the entire year, since with the falling off of construction activity, many of these trucks are expected to resume their original hauls.

The California growers anticipate an 8 percent drop in truck shipments during the 1942 - 1943 season. It has been assumed that there will be a decrease of 20 percent in truck shipments in 1943, shifting 160,000 tons, along with the small tonnage which was carried by boat in 1942, to the railroads.

As indicated in the following table, this would mean an over-all 20 percent increase in the tonnage of oranges and grapefruit moving by rail in 1943. Rail car loadings, however, should not increase at all, since the number of crates loaded has gone up from an average of approximately 400 per car to nearly 500 boxes per car.

Production & Disposition of Oranges & Grapefruit, 1941 - 1943

(In thousands)

	1941		1942		Estimated 1943	
	Boxes	Tons	Boxes	Tons	Boxes	Tons
Production:						
Oranges 1/	84,534	3,282	84,144	3,327	87,900	3,477
Grapefruit 1/	40,294	1,482	45,533	1,795	47,480	1,872
Total		4,764		5,122		5,349
Percent increase				+ 7.5		+ 4.4
Disposition:						
Processing 2/		1,229		1,307		1,338
Other disposition 3/		190		230		240
Shipments (net weight)		3,345		3,482		3,849
(gross weight)		3,546		3,691		4,080
By truck		1,082		820		656 3/
By boat		128		12		-
By rail		2,336		2,859		3,424
Percent increase in rail tonnage originated				+ 22.4		+19.8

1/ Net content of boxes varies. California and Arizona crates average 70 pounds; for oranges and grapefruit, 50 pounds. Florida and other states ship oranges in 90 pounds and grapefruit in 80 pound crates.

2/ Data from the Department of Agriculture, Food, Distribution Administration.

3/ A 20 percent decline has been assumed here.

LEMONS, LIMES AND CITRUS FRUITS, NOS

Lemons represent four-fifths of this class with the remainder consisting chiefly of limes. In 1941 rail shipments of lemons and limes dropped off by nearly a fourth as a result of the sharp decline in the California lemon crop of 1941 - 1942. Truck shipments, as reported by the California growers, declined only 8 percent and it is estimated that the trucks will regain this business during the 1942 - 1943 season. A better pick of lemons is indicated for 1942 - 1943, and it is believed that the class will increase in the neighborhood of 18 percent for the year.

Production and Shipments of Lemons and Limes, 1941 - 1943

	1941	1942	Estimated 1943
Production:			
Lemons (000 boxes)	17,230	11,700	13,650
Limes (000 boxes)	80	150	175
Tonnage of crop	658,000	450,000	524,000
For processing & other disposition 1/	290,000	155,000	180,000
Shipments, fresh (net weight)	368,000	295,000	344,000
(gross weight)	390,000	313,000	365,000
Percent change		- 19.7	+ 16.6
Rail tonnage originated	332,532	253,410	300,000
Percent change		- 23.8	+ 18.4

APPLES

Close correspondence between the increase in the production and rail shipments of apples existed in 1942: the first increased 4.4 percent; the second, 6.8 percent.

Production and Rail Tonnage, 1941 - 1943

	1941	1942	Estimated 1943
Production (bushels)	122,256,000	127,655,000	112,320,000
In short tons	3,564,000	3,191,000	2,808,000
Percent change		+ 4.4	- 12.0
Rail shipments	872,872	931,921	839,000
Percent change		+ 6.8	- 10.0

In 1943 the apple crop is expected to be about 20 percent less than in 1942, but this reduction will not affect rail shipments until the latter part of the year. Shipments of apples in the first half of 1943 are expected to be slightly higher than in the same period last year, but the last six months of 1943 should show a marked decrease below 1942. For the entire year a decrease of 10.0 percent has been estimated.

BANANAS

Approximately 600,000 long tons of bananas were imported in 1942 of which approximately 100,000 tons came from Mexico. This compares with 1,153,000 tons imported in 1941 and reveals the extent to which imports from Central America have been curtailed because of lack of shipping. A further reduction in the quota of Central American imports in 1943 has been made, and there is a possibility of reduction in rail movement of bananas from Mexico because of a crop disease and shortage of transportation facilities in Mexico. Total banana imports for 1943 are estimated at 350,000 net tons, (48 percent cut). Because rail shipments did not decline as much as imports in 1942, a reduction of only 37 percent has been applied to the figure of originated tonnage.

Imports and Rail Tonnage of Bananas, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Imports	1,291,000	671,000	350,000
Percent change		- 48.0	- 47.8
Rail tonnage	820,614	511,864	325,000
Percent change		- 37.7	- 36.5

BERRIES, FRESH

This is one of the smallest items in the rail classification report, coming to a little more than 130,000 tons in 1941. In 1942, however, rail shipments increased to 51,000 tons (65 percent). This may be explained partly by an increase of 19 percent in the number of crates of strawberries marketed - strawberries represent the largest part of the total berry crop - and by diversion from truck to rail. In 1943 a 20 percent reduction in the planted acreage of strawberries is expected, with probably a greater decrease in crop production. However, continued diversion to truck may cause very little appreciable change in the rail figure.

Commercial Marketing and Rail Tonnage of Strawberries

	1941	1942	Estimated 1943
Marketed production (000 crates)	11,300	13,400	11,000
Tons	203,400	241,200	198,000
Percent change		+ 18.6	- 18.0
Rail tonnage	31,158	51,364	52,000
Percent change		+ 64.5	+ 1.2

CANTALOUPS AND MELONS

The production of melons (other than watermelons) declined by approximately 20 percent in 1942, rail shipments by 16 percent. In 1943, a 15 percent decline in the melon crop is expected on the basis of acreage reductions and normal yield; but rail shipments should not decline as much as production, since further diversion from truck may be expected. As indicated below, rail shipments should decline only 12 percent.

Production and Shipments of Cantaloups & Melons, 1941 - 1943

	1941	1942	Estimated 1943
Production (000 crates)	13,812	11,460	9,740
Gross tonnage	469,790	389,790	331,290
Percent change		- 19.7	- 15.0
Rail shipments	211,597	178,850	157,000
Percent change		- 15.6	- 12.2

GRAPES

Production and rail shipments of grapes both declined slightly in 1942, the first by 7.2 percent and the second by 5.3 percent. Most of the grapes are shipped from California - in 1941 it is estimated that 500,000 tons of grapes were shipped from California, nearly all of this by rail. Most of these fresh shipments go to grape juice mills and to private individuals who buy from one to five carloads of grapes for wine making. Besides the decline in the tons of grapes produced, other factors tending to limit shipments of fresh grapes were the increased crushing of grapes for juice and the use of a higher percent of the raisin grapes for drying. (A WPB Order limited the use of raisin grapes for wine-making.)

In 1943 the grape crop is expected to decline still further because of storms which have injured growing facilities, and because of a general shortage of manpower on the West Coast. Some increase in grape juice output may also be anticipated, as well as the use of all raisin grapes for drying. Consequently, a further reduction in the shipments of fresh grapes seems likely, and this reduction has been estimated at 10 percent.

Production, Shipments and Rail Tonnage of Grapes, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production	2,728,330	2,531,530	2,400,000
Percent change		- 7.2	- 5.2
Rail tonnage	486,326	460,227	414,000
Percent change		- 5.3	- 10.0

PEACHES

The following table shows production and rail tonnage of peaches for the years 1941 - 1943.

Production and Rail Tonnage of Peaches, 1941 - 1943

	1941	1942	Estimated 1943
Production (bushels)	74,364	65,345	68,750
Tonnage	409,000	360,000	378,000
Percent change		- 12.0	+ 5.0
Rail tonnage	264,863	271,470	315,000
Percent change		+ 2.5	+ 16.0

It will be noted that while the peach crop declined 12 percent in 1942 below the bumper crop of the previous year, the railroads actually handled a greater tonnage of peaches. This may be explained by the fact that a considerable diversion from truck took place in those areas which rely to a great extent upon that method of shipment for transportation of the pick. In the Southern District the rail figures show that tonnage originated dropped only 4.1 percent whereas the crop in the Carolinas and in Georgia was off 15 percent. California, which relies largely upon the railroads for out-of-state shipments, had an increase in the crop picked of about 12 percent.

As indicated in the above table, it is expected that the peach crop will be approximately 5 percent greater in 1943 than in the past year. The crop is expected to be down in California, but somewhat higher in the southern states where some new trees are coming into production. Assuming that continued diversion from truck occurs, particularly in the South, it may be estimated that shipments of peaches will increase by approximately 16 percent.

WATERMELONS

As in the case of peaches, watermelons also showed an increase of rail shipments in the face of a decline in yield. Here, again, the chief explanation is diversion from trucks in the South. Although the number of melons grown in the South was 12 percent less than the quantity grown in 1941, figures show that in the Southern District for the second and third quarters of the year the tonnage of melons increased from 139.8 thousand to 143 thousand. It may be estimated that a further shifting of tonnage from trucks to the railroads will take place in 1943 and that the decline in rail shipments will not correspond to the decline in production. With both peaches and watermelons, as well as with other fruits and vegetables grown in the South, the large question is whether the trucks will return to their ordinary hauls of fruit during the second, third and fourth quarters. If construction activity declines as expected in the southern states, then many of these trucks may be used to haul fruit and the shift to railroads will be arrested. Otherwise, the railroads may actually increase their business. Estimated production and shipments of watermelons, 1941 through 1943, is shown below.

Production and Rail Tonnage of Watermelons

(Short tons)

	1941	1942	Estimated 1943
Production	806,000	715,000	600,000
Percent change		- 11.3	- 16.0
Rail tonnage	198,243	207,702	200,000
Percent change		+ 4.5	- 4.7

FRUIT, FRESH, DOMESTIC, NOS

The major fresh fruits included in this class are apricots, cherries, pears, plums and prunes, with pears representing more than half of the total fresh supply. In 1942 the pick of all these fruits was greater with the exception of plums and prunes, and the fresh supply came to 105.5 percent of 1941. Processing of the fruits declined in 1942 with the exception of cherries and pears, as indicated in the following table.

Production and Disposition of Major Fruits Included in Domestic Fruit, NOS, 1941 - 1943 1/

(Short tons)

FRUIT	PRODUCTION	DISPOSITION				
		Fresh	Canned	Dried	Frozen	Unharvested
Plums & Prunes						
1941	660,600	111,600	42,600	472,600		33,800
1942	633,500	126,000	25,700	458,400		23,300
Est. 1943	665,000	123,500	13,500	515,000		13,000
Apricots						
1941	213,900	29,324	76,000	108,350	326	0
1942	233,200	55,850	56,500	115,500	350	5,000
Est. 1943	230,000	25,600	34,000	165,000	400	5,000
Cherries						
1941	161,480	64,130	54,150	18,830*	21,870	2,500
1942	199,840	76,034	74,806	19,000	25,000	5,000
Est. 1943	185,000	63,044	74,806	18,250	24,400	4,500
Pears						
1941	728,958	532,420	171,138	19,800		5,600
1942	770,466	566,149	182,700	16,500		5,117
Est. 1943	740,000	529,800	182,700	22,000		5,500

1/ Data furnished by Fruits and Vegetables Section, Division of Statistical and Historical Research.

* In brine.

In 1943 a reduction in the yield of the various fruit crops is forecast by the Department of Agriculture, with the exception of plums and prunes. However, less fruit will be canned because of a cut in the metal containers available, leaving the estimated fresh supply only slightly below that of 1942. Hence rail shipments should decline only slightly in 1943.

Supply and Shipments of Domestic Fresh Fruit, NOS, 1941-1943

(Short tons)

	1941	1942	Estimated 1943
Fresh Supply			
Apricots, cherries, pears, plums and prunes	737,384	824,033	711,944
Cranberries	34,086	37,000	35,000
Total	771,470	861,033	746,944
Percent change		+ 5.5	- 4.6
Rail tonnage	462,333	495,532	486,000
Percent change		+ 7.1	- 1.9

FRUITS, FRESH, TROPICAL, NOS

This small class representing .00221 percent of the total originated suffered a cut of 16 percent in 1942, resulted from a reduction in the imports of fresh pineapple. Domestic production of fresh pineapple is only 300 or 400 tons a year and is negligible; but normally more than 50,000 tons of pineapples are imported from Cuba, Puerto Rico, Hawaii and other foreign sources. About 20,000 tons of olives in brine are also imported from Cuba, Chili, Spain and Portugal, and no decline was felt here. There are also some fresh figs and fresh olives in this class, but their tonnage is very small.

In 1942 imports of fresh pineapples, including shipments from possessions, were cut in half; but tonnage of this class originated declined only a sixth, the reason for this is that the imports from Cuba and Puerto Rico which represent nine-tenths of all pineapples coming into the country were all hauled from Florida up the East Coast. Formerly a large part of the shipments came into New York and other East Coast ports. Also some diversion of the olives from water to rail probably occurred.

It is believed that there will be little reduction in the imports of pineapple and olives in 1943. Some increase may actually take place. However, the rail tonnage figure has been left at the 1942 level.

Production & Rail Tonnage of Tropical Fresh Fruit, NOS, 1941 - 1943

(Short tons)

Production	1941	1942	Estimated 1943
Pineapple			
Domestic	420	175	175
Imports	34,050	18,605	18,000
Shipments 1/	18,350	6,710	6,000
Figs	1,500	4,000	5,500
Olives (in brine)	19,764	18,474	17,000
Total	74,084	47,964	46,675
Percent change		- 35.3	- 2.7
Rail tonnage	38,012	32,134	32,000
Percent change		- 15.8	- .4

1/ From Puerto Rico and Hawaii.

POTATOES, OTHER THAN SWEET

In the case of Irish potatoes the increase in rail shipments in 1942 (18.9 percent) considerably exceeded the crop increase (4.4 percent) and reflected considerable diversion both from trucks and from coastwise movements. Diversion from waterway movements, many of which were long coastwise hauls from upper Atlantic boats to the Gulf, might have been expected as a result of submarine warfare and the need of carrier vessels for other purposes; but diversion from truck has been unusually severe. With the exception of New York City, these major centers of the country showed decreases in truck unloadings of potatoes ranging from a few percentage points in the case of San Francisco to a 55 percent decline in the case of Pittsburgh. This is shown by figures on truck receipts at eleven principal markets which in 1941 received approximately 30 percent of all rail shipments of potatoes.

Carloads of Potatoes Received by Wholesalers
at Eleven Principal Markets

City	1941 Rail & Boat	1941 Truck	1942 Rail & Boat	1942 Truck
Atlanta	829	1,414	1,346	848
Boston	6,435	810	6,043	419
Chicago	17,429	393	16,675	386
Kansas City	2,856	498	3,091	285
Los Angeles	4,487	6,388	5,378	4,889
New Orleans	918	761	1,218	473
New York	10,459	11,601	9,491	12,563
Philadelphia	3,417	6,007	4,229	5,319
Pittsburgh	3,603	705	4,196	321
St. Louis	4,649	813	4,450	493
San Francisco	3,104	1,108	4,205	1,037
	58,186	30,498	60,322	27,033
Percent change			+ 3.7	- 11.4

It may be assumed that the decrease in truck shipments will continue. In the first quarter of 1943 truck unloads of potatoes at 12 principal markets were lower than in the first quarter of 1942, while rail unloads increased 8 percent. Because of heavier loadings this represents a probable increase of 20 to 25 percent in rail receipts at these markets. Already New York City has experienced a potatoe famine because of the falling off of truck shipments, a shortage of refrigerator cars, black market operations and the holding back of potatoes in anticipation of higher prices. A general scarcity of potatoes will probably be felt in the East until June. Assuming that truck shipments will decline by 10 percent in 1943 and that boat shipments will be completely eliminated, the railroads may be expected to carry 115 percent of the 1942 traffic. Should truck shipments go below the estimate made, the burden upon the railroads will be even greater.

Production and Shipments of Potatoes, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production (000 bushels)	355,602	371,150	400,660
Sales (000 bushels)	248,500	263,300	284,400
Shipments (estimate of competitive traffic)	162,140	173,260	186,840

(Cont'd.)	1941	1942	Estimated 1943
Tonnage of shipments 1/	4,864,770	5,198,400	5,614,270
Boat	174,800	49,400	0
Truck	1,349,970	1,196,000	1,076,400 2/
Rail	3,340,000 3/	3,953,000	4,537,870
Class I	3,294,594	3,915,000	4,497,000
Percent change		+ 18.9	+ 14.9

1/ Based upon reports issued by U.S Department of Agriculture, Food Distribution Administration.

2/ A 10 percent reduction in truck loadings has been estimated.

3/ Class II carriers originated 39,278 tons in 1941. Other rail loadings are estimated.

CABBAGE

While there was a 35 percent increase in the production of fresh cabbage in 1942, the rail tonnage figures increased a little more than 40 percent, with the most noticeable rise in tonnage in the last quarter of the year. In that quarter the rail tonnage of cabbage was 85 percent higher than in 1941, while the late crop, grown principally in New York, Wisconsin and Colorado, was only 7 percent above the 1941 level. This would indicate a serious shortage of farm trucks and diversion to rail.

In 1943 it is estimated that there will be 170,000 acres planted in cabbage, compared with 184,400 acres planted in 1942. This would indicate a considerable reduction in the crop, since last year had unusually good weather conditions. The Department of Agriculture reports the early cabbage crop at 350,000 tons, compared with 520,000 tons in the spring of 1941, a reduction of 33 percent. It is likely that the entire year's production of cabbage will be 20 percent below 1942. However, because of the marked shift from truck to rail, the rail tonnage figure has been reduced only 12 percent. Data of the production of cabbage for kraut have not been included, since this production does not usually involve a rail shipment.

Production and Rail Shipments of Cabbage, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production of fresh cabbage	956,900	1,289,600	1,050,000
Percent change		+ 34.8	- 19.6
Rail shipments	230,659	327,190	288,000
Percent change		+ 42.2	- 12.0

ONIONS

While commercial production of onions rose by an estimated 22.6 percent in 1942, the railroads handled a 35 percent increase in onions, indicating some shift from trucks developed during the year. Some carry-over of the unusually good onion crop into the early months of 1943 took place, and rail unloads are running slightly higher than last year on the early onions. However, a substantial decline is expected later this year, since signs point to a planted average of 112,740, compared to 136,620 acres planted in 1942. It is estimated that the crop will decline by approximately 15 percent, but rail shipments should not be reduced more than 5 percent.

Production and Rail Shipments of Onions, 1941 - 1943

	1941	1942	Estimated 1943
Production (000 sacks)	15,207	18,649	15,900
(tons)	760,350	932,450	795,000
Percent change		+ 22.6	- 14.7
Rail tonnage	370,032	500,688	476,000
Percent change		+ 35.1	- 5.0

TOMATOES

The following table shows production of shipments of tomatoes in the past two years, with estimates for 1943:

Production and Rail Shipments of Tomatoes, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production	2,802,200	3,152,700	3,100,000
Percent change		+ 12.6	- 1.6
Rail tonnage	240,613	319,883	360,000
Percent change		+ 32.9	+ 12.5

It will be noted that the quantity of tomatoes shipped by rail increased a great deal more than the crop. This was probably caused by diversion from truck: the figures on loadings reveal very great increases for the South and Southwestern regions, and it is known that in these areas there was a considerable diversion of trucks from the movement of fruits and vegetables in 1942 to construction work. As in the case of watermelons and peaches, it is estimated that there will be some further diversion from trucks in 1943. Consequently an increase in rail shipments by approximately 12.5 percent is estimated.

FRESH VEGETABLES, NOS

Vegetable production in 1943 excluding tomatoes and potatoes will be below the 1941 level and more than 10 percent below the 1942 output, according to estimates of the Department of Agriculture. This is due to several changes: (1) 1941 and 1942 were exceptionally good years for crops; (2) in setting goals the Department of Agriculture endeavored to restrict growing of certain vegetables not regarded as nutritious and emphasized the planting of other vegetables considered more desirable, such as carrots and beans; (3) the output of spring vegetables, particularly lettuce, celery and cabbage have fallen below expectations; (4) price ceilings on fresh vegetables do not afford much incentive for marketing of produce.

The following table shows estimates of quantities of ten fresh vegetables marketed in 1941 and 1942 and a forecast on probable marketings in 1943. (Fresh Vegetables Section, Bureau of Agricultural Economics.) It is believed that these vegetables represent more than 90 percent of the tonnage included in Class 143.

Tonnage & Rail Shipments of Fresh Vegetables Marketed, 1941 - 1943*

(Short tons)

Production	1941	1942	Estimated 1943
Snap beans	213,500	234,800	232,500
Green peas	118,600	93,400	81,000
Beats	54,800	55,300	54,500
Carrots	400,800	505,600	625,000
Celery	588,800	596,100	423,600
Sweet corn	104,000	95,800	100,300
Cucumbers	118,600	133,400	121,500
Lettuce	806,400	835,000	640,000
Peppers	59,100	62,400	53,100
Spinach	118,600	133,400	121,500
Total	2,583,200	2,745,200	2,453,000
Percent change		+ 6.3	- 10.6
Rail tonnage	1,687,211	1,858,954	1,766,000
Percent change		+ 10.1	- 5.0

* Table prepared with the assistance of Fruit & Vegetables Section, Division of Statistical and Historical Research, BAE.

It is not believed that rail tonnage will decrease quite as much as the quantity of fresh vegetables marketed, largely because the possibility of diversion from truck to rail will be much greater in 1943. Although the figures above do not cover all the fresh vegetables marketed in the country, the quantity marketed by truck is undoubtedly much larger than that which is handled by the railroads. A 6 percent reduction in the rail shipments seems reasonable in view of the greater decline in production.

BEANS AND PEAS, DRIED

Production of dried beans and peas increased by a fifth in 1942, largely as a result of a 90 percent higher dried pea crop. Rail tonnage originated was a trifle more than one-third greater in 1942 than in 1941, amounting actually to more than the reported crop production of unwashed peas and beans. The increase by rail was particularly noticeable in the last quarter of the year (65 percent) indicating that the crop moved earlier than in the 1941 - 1942 season.

In 1943 every effort is being made to increase production in the principal growing states of Washington, Idaho, Colorado, California and Michigan, for the output is desired for Lend-Lease and the military. It had been hoped to expand acreage of both vegetables by 50 percent, but reports of farmers' intentions to plant reveal that while a substantial increase in dried pea acreage will be realized, planting of beans for drying will be far below expectations. On the basis of a five-year average yield, total production of dried beans and peas will be slightly below last year's level. No change has therefore been made in the rail figure.

Production & Rail Loadings of Dried Beans & Peas, 1941 - 1943

	1941	1942	Estimated 1943
Production (100 lbs. bags)			
Dried beans	18,503,000	19,608,000	19,000,000
Dried peas	3,700,000	7,160,000	7,490,000
Tonnage of production	1,110,000	1,338,400	1,324,500
Percent change		+ 20.6	- 1.0
Rail loadings	1,050,608	1,418,970	1,419,000
Percent change		+ 35.0	+ 0.0

FRUITS, DRIED OR EVAPORATED

The following table shows the net weight, gross weight and tonnage originated of the principal dehydrated fruits included in this class for 1941, 1942, and estimate of the 1943 dried crop.

Production & Rail Shipments of Dried Fruit 1/

(Short tons)

	1941	1942	Estimated 1943
Plums and prunes	184,900	176,300	198,000
Raisins	210,000	263,000	275,000
Figs 2/	33,628	30,000	30,000
Apricots	20,000	22,000	22,000
Peaches	17,000	25,000	25,000
Pears	3,600	3,000	4,000
Apples	18,000	20,000	22,000
Dates 2/	29,560	7,022	7,000
Total	516,688	546,322	583,000

(Cont'd.)	1941	1942	Estimated 1943
Estimated weight of containers 3/	77,500	81,950	87,500
Gross weight	594,188	628,272	670,500
Percent increase		+ 5.7	+ 6.7
Rail tonnage	569,365	617,918	660,000
Percent increase		+ 8.4	+ 6.8

1/ Table prepared with the assistance of the Fruits and Vegetables Section, Division of Statistical & Historical Research, BAE.

2/ Imports included.

3/ At 15 percent weight of contents.

It will be noted that close correspondence exists between the estimated tonnage of dried fruit production and the quantity carried by the railroads. In 1943 it is expected that there will be an increase of approximately 42,000 tons, gross, of dried fruit, represented largely by increased drying of raisin grapes, apples, plums and prunes. The rail figure has been increased by this tonnage.

VEGETABLES, DRY, NOS

For some reason, doubtless, the chief items composing this class are carrots without tops and sweet potatoes. There is also a growing list of dehydrated vegetables, chief of which are white potatoes, carrots, sweet potatoes, onions, cabbage, beets and rutabagas. Shipment of carrots without tops has been increasing as more produce has been coming from Western states, and it is estimated that nearly a third of all carrots shipped go without tops. Production of sweet potatoes has also risen in the past few years, but analysis of the one-day studies and of figures of shipments indicate that the potatoes in this class equal only half the weight of the carrots included. Rapid expansion in the dehydration of vegetables is taking place, with more driers constantly in operation. It is estimated that dehydrated vegetables will increase from 70 million pounds in 1942 - 1943 to 226 million pounds in 1943 - 1944.

Because of the expected increase in carrot production and in the dehydration of vegetables, it is believed that the 1943 tonnage will be 180 percent of the 1942 figure of tons originated.

Production & Rail Shipments of Dried Vegetables, NOS, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Carrots without tops	120,000	168,000	209,000
Sweet potatoes	36,000	44,000	41,000
Dehydrated vegetables	7,000	30,000	90,000
Total	163,000	242,000	340,000
Percent change		+ 48.5	+ 40.5
Rail tonnage	115,227	187,077	282,000
Percent change		+ 62.6	+ 50.7

VEGETABLE-OIL CAKE AND MEAL, EXCEPT COTTONSEED

The principal cakes and meals included in this class are soybean, linseed and peanut. Like cottonseed meal, these are used chiefly as animal and poultry feeds and are by-products of the crushing of the seeds for oil. Only in the case of the soybeans, where there is a very high recovery of cake and meal per pound of beans crushed, does the value of the cake and meal exceed that of the oil. Soybean and peanut cake and meal are suitable for human consumption and experiments are being carried on to make cottonseed cake and meal more edible; but human consumption represents only a small part of total use. The following table shows percentages of oil, meal and other products obtained from each pound of seed crushed.

Vegetable-Oil Cake & Meal as a Percent of Tonnage of Seed Crushed 1/

	Cottonseed	Linseed	Peanuts	Soybeans
Cake & meal	44.3	62.5	43.0	80.0
Oil	15.5	34.0	29.0	15.0
Hulls	24.2	2/	2/	2/
Linters	9.4	-	-	-
Other products and loss	6.6	3.5	28.0	5.0

1/ Information furnished by Fats & Oils Unit, Livestock Section, Division of Historical and Statistical Research, BAE.

2/ Exact proportion of hulls is not known.

The processing of soybeans and flaxseed increased substantially in 1942 as shown in the table below, but the quantity of peanuts crushed declined because a greater portion of the crop went to cleaners and pickers. Total cake and meal production, excluding cottonseed, was 117.5 percent of 1941, while the 1943 rail tonnage of these cakes and meals was 115.6 percent of 1941.

In 1943 greater quantities of peanuts and soybeans will be available for crushing as a result of bumper crops harvested in 1942. So far, however, the rate of crushing of these seeds has not been very much above the 1942 level of operations because the nuts and beans have been kept off the market in anticipation of higher prices. Increased use of peanuts by cleaners and pickers has also cut into crushing operations. Larger crops of both soybeans and peanuts are expected in 1943 as a result of acreage increases and subsidies by the Department of Agriculture. On the other hand, the flaxseed crop is expected to be somewhat lower in 1943 than in 1942, and the demand for linseed oil will probably decline as the construction program dwindles. There is, of course, no lack of demand for the cakes and meals for animal feed, but production will depend largely upon the quantities of seed which become available to the crushers. Should shipments of soybeans and peanuts to the mills increase in the last six months of 1943, as it is believed they will, the output of cake and meal in 1943 should be 50 percent higher than during the past year. This percentage increase has been applied to the rail figure.

Production & Rail Tonnage of Vegetable-Oil Cake & Meal, Except Cottonseed, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production:			
Soybean cake & meal	1,579,400	1,984,000	3,422,000
Linseed cake & meal	796,800	888,000	840,000
Peanut cake & meal	117,500	57,000	130,000
Total	2,493,700	2,929,000	4,392,000
Percent change		+ 17.5	+ 50.0
Rail tonnage	1,795,320	2,075,152	3,113,000
Percent change		+ 15.6	+ 50.0

PEANUTS

In 1942 substantial increases took place in the production and shipments of peanuts, the crop measuring 70 percent more than the 1941 pick and shipments going up little more than 50 percent. The reason for the failure of shipments to keep up with the crop picked is that farmers are holding large stocks of peanuts on farms for higher prices. At present peanut growers are receiving 80 cents a bushel on excess production and expect $1.30 per bushel on quota production, consequently they are waiting for the end of the fiscal year when the new quotas begin. According to the table below actual shipments from farms increased only 23 percent, indicating that even though the entire crop did not come into the mills, there existed considerable diversion from truck on the part that was shipped.

Another development affecting the milling of peanuts was the buying up of a large part of the crop by edible peanut sellers for cleaning and shelling, leaving a much smaller part of the crop for crushing. As a result, production of peanut oil dropped from 150 million pounds in 1941 to 76 million pounds in 1942. In 1943 it is expected that about 725 million pounds will be cleaned and shelled, and 250 million pounds crushed. At the same time mill stocks should increase as a result of the large peanut crop forecast for the fall months. These developments are the basis for estimating a considerably greater movement of peanuts by rail, and this increase is placed in the neighborhood of 55 percent. The following table shows the computations upon which this estimate has been posited.

Production, Processing & Estimated Shipments of Peanuts, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production	738,400	1,252,000	1,856,000
Percent change		+ 69.6	+ 48.2
Milled (cleaned & shelled, crushed)	737,000	636,000	975,000
Added to mill stocks	-	156,000	195,000
Withdrawn from mill stocks	93,000	-	-
Shipped from farms	644,000	792,000	1,170,000
Percent change		+ 23.0	+ 47.7
Rail shipments	233,980	350,641	525,000
Percent change		+ 50.2	+ 49.7

FLAX SEED

The flaxseed crop of 1942 was approximately 26 percent higher than that harvested in 1941 and rail shipments reflected this increased supply with a 28.5 percent rise in originated tonnage. A considerable volume of flaxseed is imported into this country, ordinarily from Argentina, but almost all of this tonnage comes in at tidewater and does not involve a rail haul. In 1942 Argentinian imports were reduced to 3 million bushels while tonnage of flaxseed coming from Canada was increased to more than 10 million bushels; but this tonnage moves largely on the Lakes to Buffalo and consequently does not appear in the rail figures.

The following table indicates the production, estimated movements and rail shipments of flaxseed, 1941 - 1943.

Stocks, Production, Shipments & Rail Tonnage of Flaxseed, 1941 - 1943

(000 bushels) 1/

	1941	1942	Estimated 1943
Stocks on farms, beginning of year	14,568	15,661	15,512
Crop	32,285	40,660	39,875
	46,853	56,321	55,387
Used as seed	1,650	2,000	3,000
Stocks on farms at end of year	15,661	15,512	15,000
	17,311	17,512	18,000
Shipped from farms	29,542	38,809	37,387
Imported	21,100	13,700	6,000
	50,642	52,509	43,387
Total movement of domestic flax (tons) 2/	827,500	1,087,000	1,047,000
Percent change		+ 31.4	- 3.7
Rail tonnage	799,201	1,027,088	995,000
Percent change		+ 28.5	- 3.1

1/ Table prepared with assistance of Fats and Oils Unit, Livestock Marketing Section, Division of Statistical and Historical Research, BAE.

2/ Almost all the imports come in at tidewater or via the Great Lakes and do not involve a rail haul.

On the basis of the goal of 5.5 million acres, the flaxseed crop should come to approximately 40 million bushels. More will be required for seed in 1943 since further expansion of the domestic crop is desired. At the same time imports will be cut by an estimated 55 percent, bringing the total expected movements of flaxseed considerably below the 1942 levels. It is estimated that 15 percent less will be carried by Class I railroads.

SUGAR BEETS

The 1942 sugar beet crop came to 12,005,000 tons of raw beets, a 16.4 percent increase over the previous year's harvest. The railroads failed to maintain their share of the raw beet traffic, handling only 5.4 percent more beets last fall than they did in 1941 - 6,531,000 tons as compared with 6,196,000 tons. Representatives of the American Sugar Beet Growers' Association believe the explanation to be that ample truck facilities existed in the areas in which the greatest increases in production took place and that some temporary shortages of rail cars may have existed. Despite the statement by the Car Service Division of the Association of American Railroads that there were no serious car shortages reported in the sugar beet areas, it is known that there were few surplus open top cars in the last quarter of 1942; and it is quite possible that sugar beet growers in anticipation of a railroad car shortage, may have turned more of their business over to trucks. However, the actual facts of the situation are not known.

All indications point to a serious curtailment in sugar beet production in 1943. The March report of farmers' intentions show that only 70.5 percent of the acreage planted in 1942 would be planted this year. With this announcement the Department of Agriculture undertook a special support program for sugar beets, but shortly thereafter a support program for competitive crops - dried beans and potatoes - was announced. Soybeans and dried peas also compete with the beets. Moreover because of large numbers of livestock on farms, many more farmers are growing feed crops which also compete with sugar beets and other cash crops.

The 1942 yield (12.18 tons per acre) was midway between the ten-year average and the five-year average fields (11.4 and 12.7 tons per acre respectively). Therefore, it may be estimated that sugar beet production in 1943 will be at least 30 percent below the 1942 crop, and may be even lower. Whether the railroads will regain any traffic is not known, but a 30 percent reduction in rail tons of sugar beets originated appears likely at this date.

Production & Rail Shipments of Sugar Beets, 1941-1943

(Short tons)

	1941	1942	Estimated 1943
Production	10,311,000	12,005,000	8,000,000
Percent change		+ 16.4	- 40.0
Rail tonnage	6,195,766	6,531,000	4,572,000
Percent change		+ 5.4	- 30.0

PRODUCTS OF AGRICULTURE, NOS

This is a miscellaneous category which includes everything from alsike seed to zacaton fibre. Its chief constituents are coffee, tea and cocoa, fibres, soybeans, malt, spent grain and seed. Between them these items account for more than 70 percent of the entire category. Analysis of the two one-day studies made by ODT in May and September 1942 reveal the following breakdown of Class 162 by carloads of the various items:

Breakdown of Agricultural Products, NOS
By Carloads in One-Day Study

	May	September	Average Weight
Coffee, tea & cocoa	129	112	15.9
Fibres	129	50	11.8
Soybeans	68	25	6.1
Malt	125	133	17.0
Spent grain	81	84	10.9
Sugar cane	2	71	4.8
Bagasse	17	37	3.6
Beet pulp	13	23	2.4
Seed	45	82	8.4
Cottonseed hull pulp	21	21	2.8
Peanut hulls	18	7	1.7
Vegetable tallow	30	0	2.0
Nuts	1	29	2.0
Broomcorn	6	11	1.1
Hops	1	16	1.1
Tobacco stems & cuttings	9	9	1.0
Other	54	55	7.4
	749	765	100.0

However, it is not believed that this breakdown furnishes an entirely accurate picture of this class. Not only may unusual movements be found on the railroads on any particular day, but many important agricultural commodities would not be adequately represented in studies made in May and September. This is true of soybeans, four million tons of which were marketed in 1942, and which come to the mills largely in the last few months of the year. According to the percentage shown in the one-day studies, the railroads carry only 550,000 tons of soybeans! Probably, too, there are more than 430,000 tons of sugar cane shipped by rail, but this is all that the one-day studies indicate. Total sugar cane production in this country came to 5,000,000 tons in 1942. On the other hand, the one-day studies point to 1,000,000 tons of fibres on the rails, when total imports and domestic production add to approximately 390,000 tons. The percentages of malt and hops shown are also much too large to be explained by excessive fermentation in transit.

In 1942 a very substantial increase occurred in the tonnage of this class, due to greater shipments of soybeans, spent grain, malt and seeds, especially seed corn, and vegetable seeds. In addition, while the import statistics indicate that less coffee, tea and cocoa entered this country in 1942 than in 1941, there was probably a greater tonnage on the rails since many boats which formerly unloaded these commodities in New York and North Atlantic ports, docked in Gulf or South Atlantic ports in 1942, requiring a rail haul to northern processors. All told, Class 164 increased 28.4 percent in 1942.

The following table shows the production of the major agricultural commodities in this class for 1941 and 1942, with estimates for 1943.

	(In Short Tons)			Percent Increase	
Commodity	1941	1942	Estimated 1943	1942 Over 1941	1943 Over 1942
Coffee, tea, cocoa	1,527,336	1,001,554	1,160,253	- 34.4	+ 15.8
Fibres	360,954	390,414	425,800	+ 8.1	+ 9.1
Soybeans (marketed)	2,715,000	4,324,000	4,805,000	+ 59.3	+ 11.1
Malt	1,133,000	1,464,000	1,667,000	+ 29.2	+ 13.8
Spent grain	351,000	534,000	500,000	+ 52.1	- 6.4
Sugar cane	4,887,000	5,200,000	6,040,000	+ 6.4	+ 16.2
Bagasse	660,000	702,000	816,000	+ 6.4	+ 16.2
Beet pulp (dried & molasses)	282,000	325,000	260,000	+ 15.2	- 20.0
Seed (shipments)	631,000	740,540	808,420	+ 17.4	+ 9.2
Cottonseed hull pulp	1,106,000	1,085,000	1,070,000	- 2.0	- 1.4
Peanut hulls	246,000	212,000	325,000	- 13.8	+ 53.3
Nuts	142,494	123,620	109,000	- 13.2	- 11.8
Broomcorn	46,300	35,400	30,000	- 23.5	- 15.3
Hops	20,190	17,450	17,000	- 13.6	- 2.6

It will be observed that a higher output of most of the commodities is expected in 1943, with the exception of spent grain, beet pulp, cottonseed, hull pulp, broomcorn and nuts. Particularly large increases will take place in the cases of soybeans, peanuts, sugar cane, bagasse, coffee, tea and cocoa. As far as shipments are concerned, more cottonseed hull pulp will probably be on the rails, since this pulp is now used in the manufacture of furfural. Bagasse is being used increasingly as a fuel, not only at the sugar ovens but at other points in the South. By use of the figures of production and information about the various products included here, it is possible to construct a table which reflects, with some degree of accuracy, the rail tonnage of the various commodities in Class 164. According to this table, a 9 percent increase in the class may be expected in 1943.

Estimated Rail Shipments of Agricultural Products, NOS, 1941 - 1943

	1941	1942	1943
Coffee, tea, cocoa	760,000	1,000,000	1,160,000
Fibres	360,000	390,000	425,000
Soybeans	1,375,000	2,200,000	2,450,000
Malt	1,100,000	1,430,000	1,630,000
Spent grain	350,000	530,000	500,000

(Cont'd.)	1941	1942	1943
Sugar cane	480,000	550,000	580,000
Bagasse	320,000	350,000	410,000
Beet pulp	280,000	325,000	260,000
Seed	630,000	740,000	808,000
Cottonseed hull pulp	210,000	250,000	300,000
Peanut hulls	110,000	100,000	150,000
Nuts	135,000	120,000	105,000
Broomcorn	40,000	30,000	25,000
Hops	20,000	17,000	17,000
Other	804,000	926,000	950,000
Total	6,974,000	8,958,000	9,770,000
Percent change			+9.1

II. ANIMALS AND PRODUCTS

Animals and animal products represent less than 2% of total rail loadings. In 1942 total tonnage originated by Class I carriers amounted to 20.6 million tons, an increase of approximately 23% over 1941. The chief reasons for this increase were (1) a greater number of animals moving to market, (2) diversion from truck to rail in the transportation of livestock to market (reports of livestock receipts show that 66.6% of the animals were trucked in 1941 and only 62.8% in 1942), (3) substantial diversion to rail in the case of cured meats, poultry, eggs, cheese, hides and wool. In the case of hides and wool considerable increases in tons and ton-miles occurred because of re-routing of imports so as to minimize ocean shipping.

It is to be noted that live animals represent a little less than 40% of the entire group; meats, including dressed poultry, a little less than 30%; other by-products of meat packing, such as lard, tallow, scraps, etc., 10%; with the remainder composed of dairy and poultry products, hides, leather, and wool. Only in the case of livestock marketings and in the loadings of meats and poultry products can any increase be expected in 1943. So far this year the number of animal units marketed has not come up to expectations and there has been a lower tonnage of federally-inspected meat and less recovery of essential by-products, because of the existence of the black market.

At the present time about the same number of cattle and only a few more hogs have come into the market than were received during the same period of 1942. Further diversion from truck may be expected in the fall of the year and the truck situation may be serious in 1944. Many animal units are still on the farms where they are being held for feeding and in anticipation of higher prices and may suddenly be marketed in large numbers, placing a strain upon stock car capacity. In the rail transportation of all animals and animal products a 10% increase is expected in 1943.

HORSES, MULES, PONIES & ASSES

The total tonnage of this class is not very great amounting to less than 150,000 tons. However, the number of horses carried by the railroads in 1942 showed an increase of 11.7% over 1941, due largely to the numbers of horses purchased by the Army. Colonel Daniels, Chief of Remount Division of Quartermaster Corps, states that the Army will maintain the same number of animal units in 1943 as 1942. This could be interpreted to mean that fewer horses will be moved off farms by the Army in 1943 than in 1942; but on a conservative basis the tonnage of horses to be moved by rail has been left at the 1942 figure of 143,000 tons. This does not include, however, any estimate of the number of heads which may be shipped for horsemeat.

LIVESTOCK

A large increase in the number of livestock moved by rail (and of the meat and packinghouse products derived from slaughter) occurred in 1942. The increase results from the following factors: (1) a larger number of beef cattle, calves, sheep, and especially of hogs, moving to market and (2) substantial diversion of tonnage from trucks, (3) a general increase in the weight of meat animals, particularly of hogs, which tended to increase tonnage figures.

The numbers of animals received at principal markets and of federally-inspected livestock do not cover all movements and slaughter of animals, and the two sets of figures are not comparable. Nor do they compare very closely with rail tonnage originated in the various classes of livestock. Carlots of animals, by truck and rail, are reported at 68 principal markets in the U. S. which are believed to handle 72% of the cattle, 65% of calves, 62% of the sheep, and 46% of all hogs. It is possible also for an animal to be shipped from one market to another so that considerable duplication may exist in the receipts. The livestock which are inspected by federal agents before slaughter are estimated at 75% of the total slaughter, though there is no certainty as to this figure, owing to the numbers of animals which may be slaughtered on the farm or by private butchers.

The rail figures include not only animals brought to market for slaughter, or those shipped from one market to another, but also large numbers of sheep and lambs, and to some extent of cattle, which are brought off the ranches and ranges to feed in the mid-western and other areas. It has been estimated by the Livestock Marketing Unit of the Bureau of Agriculture Economics that two-thirds of the lambs and one-third of the cattle are carried by rail to other areas for feeding.

All the figures agree, however, that there were more units of livestock slaughtered and moved in 1942 than in the previous year, an increase which amounted to about 16% in the first case and 25% in the second. Receipts at 68 principal markets also show a considerable diversion from truck in 1942, and it is believed that such diversion will be continued in 1943, even though many of the trucks coming to the markets are only one-half to two-thirds loaded. The following table shows the diversion for 1942 and the estimated trends for 1943.

Receipts of Livestock at 68 Principal Markets
in the U. S., 1941 & 1942, Estimated for 1943 1/

		Heads (000)	Average Weight	Tons (000)	Percent By Truck	Percent By Rail	Tons By Rail (000)
Cattle	1941	15,288	960	7,338	68.9	31.1	2,282
	1942	17,979	953	8,567	63.9	36.1	3,093
Est.	1943	18,404	950	8,742	60.0	40.0	3,497
Calves	1941	6,128	196	601	67.4	32.6	196
	1942	6,681	208	695	64.0	36.0	250
Est.	1943	7,442	215	800	62.0	39.0	312
Sheep &	1941	22,817	88	1,004	34.0	66.0	663
Lambs	1942	28,211	89	1,255	32.3	67.7	849
Est.	1943	27,348	89	1,217	30.5	69.5	846
Hogs	1941	30,650	241	3,694	70.5	29.5	1,089
	1942	34,415	245	4,216	69.4	30.6	1,290
Est.	1943	39,020	255	4,975	68.0	32.0	1,592

1/ Data from U. S. Department of Agriculture, B.A.E., Livestock Marketing Section

The numbers of livestock federally inspected in 1941 and 1942, and estimates for 1943, and the average weights of the animals slaughtered are shown in the following table. These changes in the number of heads and in the weights have been applied to the table of receipts to get estimates for 1943.

Numbers & Average Weights of Animals Slaughtered Under Federal Inspection, 1941-1943 1/

	1941		1942		1943	
	(000 Units)	Average Weight	(000 Units	Average Weight	(000 Units)	Average Weight
Cattle	10,946	960	12,300	953 2/	12,500	950
Calves	5,461	196	5,700	208 2/	6,000	215
Sheep & Lambs	18,125	88	21,300	89	19,900	89
Hogs	46,650	241	54,300	245	63,000	255

1/ Data from Livestock Marketing Unit, B.A.E.

2/ The reason for the decreasing weight of cattle and increasing weight of calves is that more animals on the border line (400 lbs.) are marketed as calves in order to obtain veal prices.

The figures of tonnage carried by Class I Railroads follow closely the trend of federal inspection and market receipts in the case of hogs, but do not compare very favorably with similar statistics for sheep and lambs, and cattle and calves, probably because the latter meat animals are moved for feeding. In the case of cattle and calves the figures of rail tonnage originated are higher than figures for federal inspection of market receipts but lower than figures reported of railroad receipts at principal markets. In the case of sheep and lambs the rail increase for 1942 is lower than any of the other figures. This may be more clearly seen in the following table which includes also estimates for 1942 based upon past performance and early trends reported for 1943:

Tonnage of Livestock Federally Inspected, Tonnage Received at Public Markets, Rail Tonnage of Market Receipts & of Class I Carriers for 1941 & 1942, Estimated for 1943

(000 Tons)

Cattle & Calves	1941	1942	Estimated 1943
Federal Inspection	5,789	6,454	6,583
% Change		+11.5	+ 2.0
Receipts at Markets	7,939	9,262	9,542
% Change		+16.7	+ 3.0
Receipts at Markets by Rail	2,282	3,093	3,809
% Change		+35.6	+23.1
Class I Carriers	3,529	4,485	5,088
% Change		+27.1	+13.4
Sheep & Lambs			
Federal Inspection	798	948	896
% Change		+18.8	- 5.5
Receipts at Markets	1,004	1,255	1,217
% Change		+25.0	- 3.0
Receipts at Markets by Rail	663	849	846
% Change		+28.1	- 0.4
Class I Carriers	947	1,087	1,033
% Change		+14.8	- 5.0
Hogs			
Federal Inspection	5,621	6,652	8,032
% Change		+18.3	+20.7
Receipts at Markets	3,694	4,216	4,975
% Change		+14.1	+18.0
Receipts at Markets by Rail	1,089	1,290	1,592
% Change		+18.4	+23.4
Class I Carriers	2,054	2,415	2,946
% Change		+17.6	+22.0

As indicated above diversion from truck is expected to continue in 1943 and may be particularly serious in the 1943-1944 marketing season. It is believed that a large number of farm trucks are at present immobilized, either permanently or temporarily, because of lack of parts, and that they will be unable to handle the share of the traffic in 1943 which they carried in 1942. The percent of the total tonnage of livestock receipts carried by truck and by rail for 1940-1943 is as follows:

Livestock Receipts at Principal Markets

	Percent By Truck	Percent By Rail
1940	63.7	36.3
1941	66.6	33.4
1942	62.8	37.2
1943	60.3	39.7

FRESH MEAT

The output of fresh meat follows closely the weight of animals slaughtered. In 1942, the tonnage of fresh meat increased about 15%--due primarily to large increases in the number of cattle and pigs marketed--while the weight of animals slaughtered increased 16% over the previous year. (Both sets of figures are for animals slaughtered under Federal inspection).

It is very difficult at this time to estimate future marketing of animals. Farmers and raisers are holding back on their stock, using an ample feed supply, in the hopes of getting higher prices, and many animals are being sold on the black market and do not come to the public markets and slaughter houses. Early indications are that the pig crop will be considerably larger than last year, and the average weight per porker 10 pounds higher. Although the number of sheep marketed is expected to be somewhat less than in 1942, there should be an equal volume of cattle and calves slaughtered and possibly an increase in the numbers marketed later in the year.

The increase in the rail tonnage of fresh meat in 1942 (12.7%) is close to the 15.1% increase in fresh meat production. For 1943 the Livestock Marketing Unit of the Bureau of Agricultural Economics has very cautiously estimated an increase of 10.6% in the fresh meat supply. For the railroads a 10% increase in the originated tonnage figure has been selected.

Production and Rail Tonnage of Fresh Meat, 1941-3 1/

(Short tons)

	1941	1942	Estimated 1943
Production			
Beef and veal	3,169,000	3,507,000	3,577,500
Lamb and mutton	375,000	440,000	407,500
Pork	3,172,500	3,781,000	4,561,500
Total	6,716,500	7,728,000	8,546,500
% Increase		+ 15.1	+ 10.6
Rail tonnage	3,407,018	3,841,953	4,226,000
% Increase		+ 12.7	+ 10.0

1/ Slaughtered under Federal Inspection.

CURED, DRIED OR SMOKED MEAT

The cured meat class presents an entirely different picture from the fresh meat. In 1942, the output of cured meats increased less than 10% but rail tonnage went up more than 100% as shown in the following table:

Production and Rail Tonnage of Cured, Dried or Smoked Meats
(Short tons)

	1941	1942	Estimated 1943
Production			
Beef	68,500	62,500	70,000
Pork	1,444,000	1,591,500	1,730,000
Total	1,512,500	1,654,000	1,800,000
% Change		+ 9.4	+ 8.8
Rail Tonnage	758,571	1,536,828	1,780,000
% Change		+ 100.3	+ 15.8

From the above figures it is apparent that the railroads during the past year carried almost the entire tonnage of cured and smoked meats produced. The reason is that this class of meats was diverted from civilian use to meet the requirements of the Armed Forces and Lend-Lease. In 1943 it is estimated that the railroads will again carry nearly all the output of this class and, as indicated above, this would mean an increase of roughly 13%.

BUTTERINE AND MARGARINE

This small class, composed largely of oleomargarine, showed a remarkable increase in 1942, rising from 28,000 tons to more than 65,000 tons originated. The increase may be accounted for by the following factors: (1) a 15% increase in production of oleomargarine, (2) increase shipments out of storage to meet the considerable demand for butter substitutes, (3) large purchases by the U. S. Government for Lend-Lease and the Army.

In 1943 it is estimated that oleomargarine production will be 70% higher than in the past year. At the same time withdrawals for use of the U. S. will have to increase to meet Lend-Lease and military demands. Consequently a considerable increase of rail shipments (80%) is anticipated in 1943.

Production and Rail Tonnage of Oleomargarine, 1941-3
(Short Tons)

	1941	1942	Estimated 1943
Production	184,000	212,500	360,000
% Change		+ 15.4	+ 69.4
Rail Tonnage	27,959	65,140	117,000
% Change		+140.7	+ 80.0

(Cont'd)

	1941	1942	Estimated 1943
Withdrawn for use of U.S. 1/	1,500	29,000	37,000
Other	26,459	36,140	80,000
% Change		≠ 36.5	≠121.3

1/ Reported by Bureau of Internal Revenue

EDIBLE PACKINGHOUSE PRODUCTS, NOS

The largest single item in this class is lard with about 40% of the total tonnage; other packinghouse products classed here include salted meats, oleo oil, sides, chucks, trimmings, sausage casings, animal stearine, and tallow. In 1942 the production figures reveal a 12.8% increase, corresponding closely with a rise of 13.4% in rail tonnage originated. The production of lard depends upon the number of hogs marketed through regular channels (not the Black Market) while the other edible products follow closely the trend of cattle and calves. For the first quarter of 1943 the marketing of animals has clung to the level attained in the first quarter of 1942 but a slight increase has been noticed recently and it is hoped that the last half of the year will show a decidedly upward trend. For the entire year a 10% increase has been estimated in the production of edible packinghouse products, and the rail tonnage figure has been placed 12% above 1942.

Production and Rail Tonnage of Edible Packinghouse Products
1941-1943 (Short Tons) 1/

	1941	1942	Estimated 1943
Production			
Lard	763,000	862,000	950,000
Other Edible Products	1,190,000	1,341,000	1,477,000
Total	1,953,000	2,203,000	2,427,000
% Increase		≠ 12.8	≠ 10.2
Rail Tonnage	903,949	1,024,216	1,147,000
% Increase		≠ 13.4	≠ 12.0

1/ Federal inspected slaughter only.

LIVE AND DRESSED POULTRY

Although the figures submitted by the Department of Agriculture indicate that the production of dressed poultry increased about an eighth in 1942, rail tonnage of live and dressed poultry increased roughly a third in each case. The explanation for the unusual jump in rail traffic does not lie in the changes of stocks because these increased about 15,000 in 1942 -- a small tonnage as compared with the total dressed weight. Nor did exports of dressed poultry affect the situation, for these amounted to less than 2,000 tons. The most likely explanation is that a substantial diversion from truck occurred in 1942, plus the fact that higher prices paid for poultry enabled more shippers to use the railroads. The result is that in 1941 the railroads handled one-sixth of the dressed poultry and in 1942 about one-fifth of the total tonnage.

A substantial increase in the total dressed weight of chickens and turkeys is expected in 1943 based upon the large numbers of poultry now being raised on farms and the shortage of other meat. Should the estimated 27% increase of dressed poultry occur, the railroads should increase their weight of poultry even more and it is believed that a 50% increase in the dressed weight is not improbable. A similar figure has been applied to the tonnage of live poultry which constitutes one of the smallest rail classes. Over 90% of the tonnage of live poultry is moved by truck.

Live and Dressed Poultry

Dressed Weight of Poultry, Rail Tonnage of Live & Dressed Poultry
1941-1943

(Short Tons)

	1941	1942	Estimated 1943
Dressed Chickens	1,361,000	1,559,000	2,000,000
Dressed Turkeys	237,500	242,500	280,000
Total	1,598,500	1,801,500	2,280,000
% Change		+ 12.7	+ 26.6
Rail Tonnage of D. P.	266,431	349,291	540,000
% Change		+ 31.2	+ 50.0
Rail Tonnage of L. P.	17,503	21,291	30,000
% Change		+ 21.6	+ 40.9

EGGS

Although domestic production of eggs increased approximately 15% in 1942, the tonnage of fresh eggs shipped declined slightly because of the number dried for military and lend-lease.

In 1943 a further increase in egg production is expected (about 18%) based upon the present egg production and the large number of chicks being raised on farms. The price of eggs should be sufficiently high to warrant keeping a large part of the hens for egg-laying rather than for selling the chickens off as broilers. At the same time egg driers are operating at 50% of capacity and some going out of operation because the price of dried eggs is not high enough to warrant profitable operation. It is estimated that the number of eggs actually dried will be far below the million dozen required by the Army and Lend-Lease. On this basis fresh shipments should increase nearly 25%, and the rail shipments may be expected to increase accordingly.

Production and Rail Shipments of Fresh Eggs, 1941-3

	1941	1942	Estimated 1943
Production (000 dozen)			
All eggs	3,828,000	4,414,000	5,200,000
Used on farms	685,000	685,000	685,000
Dried	--	720,000	800,000
Fresh Shipments	3,143,000	3,009,000	3,715,000
Gross Weight of Fresh Shipments 1/	2,710,840	2,595,260	3,204,190
% Change		- 4.3	+ 23.5
Rail Tonnage	391,976	398,386	518,000
% Change		+ 1.6	+ 30.0

1/ Adding 15% of net weight for containers.

CHEESE

In 1942 unusually large shipments of cheese occurred which increased the rail tonnage figure from 295,000 to more than 530,000 tons, an increase of 80%. This may be explained by the greatly increased consumption of cheese as a substitution for meat and the Lend-Lease program which took 156,000 tons of cheese in 1942 as compared with 45,000 tons in 1941.

Cheese movements are very complicated involving the following moves: (1) the shipment of cheddar cheese for mixing with other cheeses in final processing; (2) shipment of the finished cheese to cold storage; (3) shipments from storage or from point of production, domestic consumers or for export. During 1941 there was an accumulation of stocks of approximately 36,000 tons, and in 1942 a withdrawal from stocks of 35,000 tons. From January 1943 to March 1, 1943 there was another drop of about 19,000 tons in stock, one of the factors which has induced the rationing of cheese beginning April 1943. Although there is no satisfactory method of getting at shipments of cheese, it is believed that the following table indicates, in a rough way, the probable changes in shipments of cheese, 1941-1943.

Production, Estimated Shipments & Rail Tonnage of Cheese, 1941-1943
(Short Tons)

	1941	1942	Estimated 1943
Production			
American	378,500	458,500	412,500
Other	99,500	100,500	75,000
Imports	10,000	12,000	10,000
Exports	45,500	170,000	100,000
Total	533,500	741,000	597,000

(Cont'd)	1941	1942	Estimated 1943
Added to Stock	36,000	--	--
Withdrawn from Stock	--	35,100	6,000
Estimated Shipments	496,500	776,100	603,500
% Increase		+ 56.5	- 22.3
Rail Tonnage	294,716	516,078	455,000
% Increase		+ 75.5	- 11.8

In 1943 production, imports and Lend-Lease exports of cheese will be expected to drop. Stocks are expected to be at approximately 60,000 tons on January 1, 1943. Consequently, a 20% decrease in movements is regarded as probable, and the rails figure has been adjusted accordingly.

BUTTER

Although the production of butter declined in the neighborhood of 5% in 1942, the number of tons carried by rail increased slightly. This is due to large withdrawals from stock in 1942 compared with some additions to stock in the previous year. In other words, sales--and it is believed total shipments--increased about 3%, closely corresponding with the trend in rail shipments.

In 1943 a further 5% drop in production is expected, resulting from the continued shift from butter manufacture to fluid milk, evaporated milk and cheese production. At the same time stocks are down to a month's supply and with the onset of rationing it is unlikely that withdrawals from stock will match those of 1942. One factor tending to throw more traffic to the railroads is the large increase in exports from 171 million pounds in 1942 to an estimated 414 million pounds in 1943. Nevertheless, butter tonnage should decrease from 5 to 10% during the coming year.

Production & Rail Shipments of Butter, 1941-3
(Short Tons)

	1941	1942	Estimated 1943
Production			
Creamery	934,500	885,000	842,500
Farm Sales	34,000	32,500	30,000
	968,500	917,500	872,500
Added to Stocks	36,500	--	--
Withdrawn from Stocks	--	45,000	--
	932,000	962,500	872,500
% Change		+ 3.3	- 9.4
Rail Tonnage	489,628	500,639	471,000
% Change		+ 2.2	- 5.9

WOOL

Although domestic production of wool remained at about the same level in 1942 as it was the previous year--approximately 227,000 tons--and consumption of wool by mills rose only 9%--from 514,000 tons to 560,000 tons-railroad tonnage of wool jumped from 552,000 to 877,000 tons, or nearly 60%. (All figures are on a grease weight basis). The factors which account for this are (1) an increase of imports from approximately 400,000 tons in 1941 to more than 700,000 tons in 1942; (2) diversion from water shipment of South Pacific, South American and South African wool imported into the United States. Normally this wool comes through the Panama Canal or up the Atlantic to Boston where it is scoured and corded. In 1942 wool from the South Pacific was docked at West Coast Ports and shipped by rail to Boston, and much of the South American and South African wool was brought into South Atlantic Ports and then shipped by rail to New England. About 226,000 tons were added to the U.S. stockpile and 140,000 tons to the British stockpile in this country. There was also some diversion of coastwise movements from Gulf Ports to an all-rail haul to New England. However, this added to ton-miles but not to total tonnage carried by railroads. In 1939, 31,534 tons were shipped from Galveston.

In 1943 no increase is expected in domestic production of wool, and there should be some decline in imports, since it is planned to add only about 200 million pounds to the British and American stockpiles. Consumption of wool by the mills should go up from 1,090,000 pounds to 1,200,000 pounds; but because of the reduction in imports it seems likely that the rail tonnage will decrease as shown in the following table:

Supply and Rail Shipments of Wool, 1941-3 1/

(Short Tons)

Total Supply	1941	1942	1943
Domestic Clip	194,500	196,000	195,000
Domestic Pulled	33,000	30,000	30,000
Imports (U. S.)	396,300	566,600	463,000
Imports (British)	---	140,000	120,000
Total	623,800	932,600	808,000
% Change		+ 49.5	- 13.4
Rail Shipments	552,467	877,110	798,000
% Change		+ 58.9	- 10.1

1/ Table prepared with assistance of Textile and Leather Division, W.P.B.

HIDES

Although the domestic production of hides, particularly cattle, hides and sheep skins, was greater in 1942 than in 1941 because of the increased marketing of animal units, total rail shipments of hides remained about the same. This condition resulted from the slackening off of imports from South America and Africa. However, in 1942 most hides imported from Argentina came to New Orleans and were railed North, whereas in pre-war days they came to Boston, New York and Philadelphia--adding considerably to ton-miles. Further reduction in imports, and only slight increase in the domestic production of hides, should result in slightly decreased shipments in 1943. The following table shows the hides situation in 1941 and 1942 and the picture as foreseen for 1943 and indicates the close relationship of production and imports with the tonnage of hides shipped by rail.

Production, Imports & Rail Shipments of Hides, 1941-3

	1941		1942		Estimated 1943	
Hide or Skin	(000)	Tons	(000)	Tons	(000)	Tons
Cattle Hides						
Domestic	17,860		19,746		19,000	
Imports	9,058	605,650	5,771	574,130	5,000	540,000
Calf Skins						
Domestic	10,800		12,563		12,600	
Imports	1,664	63,000	2,335	75,445	1,860	73,000
Goat Skins						
Domestic	250		250		250	
Imports	49,470	41,540	36,750	30,250	39,200	32,250
Sheep and Lambs						
Domestic	18,124		21,625		20,000	
Imports	42,142	210,930	39,804	215,000	38,500	210,000
Total Tonnage		921,120		894,825		855,250
% Change				- 2.9		- 4.4
Rail Tonnage		854,264		859,252		850,000
% Change				+ 0.6		+ 0.0

LEATHER

Tons of leather on the railroads increased by 19% in 1942 largely as the result of a stepping up of tanning operations. As shown below the largest increase was in the number and weight of cattle hides tanned. In 1943 there is expected to be a shortage of cattle hides because of the decline in imports and the failure of cattle to appear in the desired numbers on the market. The availability of calf, goat and sheep skins will not change to any marked extent, but because of the importance of cattle hides in the leather picture, it is anticipated that the entire class will be 10% lower in 1943.

Production and Rail Shipments of Leather, 1941-3 1/

	1941		1942		1943	
Number of Hides Tanned	(000 Pcs.)	(000 Tons)	(000 Pcs.)	(000 Tons)	(000 Pcs.)	(000 Tons)
Cattle 2/	28,121	470	30,828	515	27,800	463
Calf & Kips	13,098	59	12,264	55	11,800	53
Goat & Kid	45,373	27	41,127	20.5	44,000	22
Sheep & Lamb	51,915	78	53,629	79.5	52,000	78
Total Tonnage	634,000		670,000		616,000	
Added to Stocks	13,200		---		---	
Withdrawn from Stocks	---		24,500		---	
Estimated Shipments	620,800		694,500		616,000	
% Change			+ 12.0		- 11.3	
Rail Tonnage	176,656		210,759		190,000	
% Change			+ 19.3		- 10.0	

1/ Data for 1941 and 1942 from U. S. Department of Commerce. Estimates for 1943 from Textiles and Leather Division, W.P.B.

2/ Including large kips.

FISH AND SEA ANIMAL OIL

A 20% drop in fish and marine mammal oils occurred in 1942 as a result of a decline in the catch, especially of menhaden, and a decline in imports of cod liver oil. This was accompanied by a corresponding decline in rail shipments. It will be noted that the tons of fish and sea animal oil loaded by the railroads greatly exceed production and imports. This is because the class represents a double shipment of the oils, first in tank cars to the refiners and then in containers in box cars.

Further reduction is foreseen for 1943 largely because of decreased imports of whale oil and cod liver oil. As indicated below, rail shipments should fall by approximately a fifth.

Production, Imports and Rail Shipments of Fish and Sea Animal Oils, 1941-3 [1]

(Short Tons)

	1941	1942	1943
Production	110,460	70,232	70,000
Imports	17,830	32,382	5,000
Total Supply	128,290	102,814	75,000
% Change		- 19.9	- 27.0
Rail Tonnage	215,634	179,005	143,000
% Change		- 16.7	- 20.0

[1] Data furnished by Fats and Oils Branch, Food Distribution Administration.

LIVE ANIMALS, NOS

This tiny class of less than 2,000 tons in 1941 had a new lease on life in 1942, and the little not otherwise specified animals crowded into the railroad cars creating one of the minor crises of modern railroad history. The tonnage of these animals originated by Class I railroads in 1942 came to the impressive figure of 5,656 tons an increase of 195.7%! Small wonder that a shortage of motive power and cars developed as these NOS creatures spread up and down and throughout the length of the country's railroad system.

What were these animals? Were they live bees with or without hives? Were they fleas following the circus animals around? Could they have been sea horses, set up, knocked down or dragged out? Or did something fall out of Class 701 when the railroad was not looking?

The answer--insofar as it is not a military secret--is that these swarming animals were shellfish which had forgotten to remove their shells. Had they come out of their shells they could have traveled luxuriously in refrigerator cars as shucked clams, oysters, shrimp and the like--in Class 282, Animal Products, NOS. As it was there weren't enough people around to separate shell from fish and they were forced to move unshucked in an unpopular class. In 1943 times will be even harder, with the growing shortage of shuckers, and the poor fish will still have to wear a Shell Label on their backs. Unless a Czar is appointed to control the situation, the railroads may be faced with the problem of carrying 12,000 tons of these live creatures in 1943.

ANIMAL PRODUCTS, NOS

This class is a heterogeneous aggregation composed of edible and inedible animal products. Chief among the edible products are fresh milk, skimmed milk, and buttermilk, eggs, fish and fish meal, and meat scraps. The inedible items include tallows and greases, animal hair, glue stock, and seashells.

In 1942 this class increased from 1,792,000 tons to 2,105,000 tons (17.4%) as a result of increased slaughter of animals and larger production of fresh milk and eggs. Most of these items will be held fairly constant in 1943, although there should be a slight increase in inedible animal tallows and greases. The following table itemizes the various animal products included in this class and assigns to each a percentage based upon its proportion of the total carloads of the class reported in the one-day studies made by O.D.T. The percent change expected in each item is based upon information obtained from the Department of Agriculture, principally the Livestock Marketing and Dairy Products Sections of the Division of Statistical and Historical Research, Bureau of Agricultural Economics.

Breakdown and Expected Change in Class 282, Animal Products, N.O.S.

Item	1942 Weight 1/	Percent Change		1943 Weight
Edible Products				
Buttermilk (Chiefly condensed and dried buttermilk)	3.2	--	2/	3.2
Casein	1.2	--	2/	1.2
Dry Skimmed Milk	2.6	+14.0	2/	2.6
Fresh Milk	19.0	- 1.7	2/	18.7
Eggs, frozen, dried, whites and yolks	12.1	+ 4.1	3/	12.6
Feeding, tankage	2.7	+10.0	4/	3.0
Fish, fresh, fish meal and scraps	6.0	-10.0	5/	5.4
Meat Scraps	3.8	+10.0	4/	4.2
Inedible Products				
Animal Grease, Oils, & Tallow	20.5	+ 5.0	6/	21.5
Animal Hair	5.3	+10.0	7/	5.8
Fleshings	1.0	--	8/	1.0
Glue Stock	5.5	+ 4.0	9/	5.7
Hides and Pelts, dry	2.1	--	10/	2.1
Seashells	8.5	-20.0	11/	6.8
Wool Grease	3.5	--	12/	3.5
Other	3.3	--		3.3
Total	100.0			100.6

1/ Based upon analysis of O.D.T. one-day studies.

2/ Production of various milk products (in millions of pounds):

	1942	1943
Buttermilk, condensed	130	130
Buttermilk, dry	74	75
Casein	40	40
Dry Skimmed Milk	570	650
Fluid Milk	120,000	118,000

3/ Frozen eggs and egg whites and yolks not expected to change. 800 million dozen eggs will be dried in 1943, compared with 720 million dozen in 1942.

4/ Increase resulting from greater slaughter of animals.

5/ It is expected that shortage of manpower will cut down the catch despite increased demand for fish as a result of meat rationing. Bureau of Wildlife and Fisheries, U. S. Department of Interior.

6/ Production of inedible tallow and greases: 1942 - 899,300 tons; 1943 - 944,000 tons (est.).

7/ Largely from pigs.

8/ Substance scraped from hides. No increase expected in hides.

9/ Derived from slaughter of cattle and calves. See above under Cattle and Claves.

10/ See previous analysis of Class 270, Hides.

11/ Based upon decline in catch of shellfish and decline in construction.

12/ See previous analysis of Class 260, Wool.

According to the analysis detailed above, this class may be expected to increase only slightly in 1943. It is estimated that the tonnage of Animal Products, NOS will approximate 2,147,000 tons, an increase of 2%.

GROUP III. PRODUCTS OF MINES

From the standpoint of the tonnage involved, mine products represent nearly 60 percent of all rail loadings. The most important commodities in this group are the solid fuels: bituminous and anthracite coal, and coke represent one-third of the grand total of 1.4 billion revenue tons originated by the railroads and nearly 28 percent of all revenue ton-miles. In addition, between 75 and 80 million tons of coal were hauled in 1942 as non-revenue freight. The next in importance after the solid fuels are the ores with one-eighth of the total tonnage, iron ore alone totaling more than 110 million tons. Sand, gravel and building stone increased to a total figure equal to one-twelfth of all rail revenue tonnage, and there is a considerable tonnage of these items hauled as non-revenue freight for ballast and other construction work. Other important mine products include limestone, of which the railroads carry an estimated 26 million tons (exclusive of that hauled as non-revenue freight); crude petroleum, which jumped to 25 million tons in 1942; asphalt, phosphate rock, salt, sulphur, glass and foundry stone. Limestone and sand, other than building sand, are listed in Class 392, Products of Mines, NOS. The following table shows the revenue tonnage of the various groups of mine products and the percentage of total loadings which each group represented in 1942.

Products Of Mines	Revenue Tons Originated	% Of Grand Total Of Tons Originated
Coal and Coke	471,166,005	33.6
Ores	124,809,591	8.9
Sand, Gravel, Stone	117,744,483	8.4
Other Mine Products	90,926,590	6.5
Total Products of Mines	804,646,669	57.3

A remarkable increase in the tonnage of mine products carried by the railroads (17.6 percent) occurred in 1942 as a result of the following factors: (1) a large increase in the demand for coal and coke for industrial and heating purposes. Railroads consumed 122 million tons of soft coal, the steel industry, 92 million tons and public utilities, 64 million tons. 55 million tons of coke were consumed in steel manufacture and 56 million tons of anthracite in residential heating. Part of this demand represents conversion from the use of petroleum products for fuel. (2) the need of abundant ore supplies to meet requirements for critical materials, especially iron and steel products, copper and aluminum. More than 105 million tons of iron ore were consumed by the steel industry, and 6 million more tons were stockpiled, each ton requiring a rail haul. A substantial increase took place also in the tonnage of zinc ore and concentrates carried by the railroads. (3) Rapid expansion of the building program which absorbed a large tonnage of sand, gravel and stone, equal to more than a 150 percent of the 1941 use. (4) An increase in the use of limestone and molding sand in the steel industry, and increase use of limestone for cement manufacture and fertilizer production. (5) Nearly a three-fold increase in the loadings of crude oil in railroad tank cars in order to maintain a flow of crude oil to eastern refineries in the absence of tanker shipments.

It is unlikely that the tonnage of mine products carried by the railroads in 1943 will be significantly higher than the 1942 figure. Some increase in the output of coal and coke, barring a serious strike, is to be expected as the rate of mining and of coking is stepped up. There should also be a slight increase in the ores: iron ore traffic, however, has been hard hit by the late opening of the Great Lakes shipping season and it is unlikely that more than 3 million additional tons will be carried by the railroads in 1943. Zinc, ore, bauxite and alumina production will increase substantially and there should be a greater volume of crude oil hauled to the East Coast and dry salt loaded for use of chemical and metallurgical plants. However, these additional shipments will be offset by substantial decreases in the tonnage of construction materials, sand, gravel and stone, as a result of an estimated 30 to 40 percent reduction in the building program in 1943. The National Industrial Conference Board reports that construction activity has already declined from 16 to 25 percent in terms of the number of men employed and in terms of the dollar value of contract awards. Another index of construction activity is cement manufacture, in which a 30 percent drop is expected during the coming year. The decline in construction should also affect Class 392, Products of Mines, NOS, in that the drop in limestone used as a building material will more than offset any increases which may take place within the class. Altogether, it is estimated that the 1943 tonnage of mine products carried by the railroads will equal 805.5 million tons, compared with 804.6 million tons in 1942.

ANTHRACITE COAL

The production of anthracite coal has been increasing at the rate of from 7 to 9 percent a year but now shows definite signs of leveling off despite increased requirements for hard coal. It is, of course, difficult to know what the exact production figures are: while the Pennsylvania Bureau of Mines reports tonnage of authorized anthracite production, the tonnage of bootleg coal mined in past years has been considerable, running as high as 7 or 8 million tons per year prior to 1940. With better wages in the mines, and with agreement reached between the state officials, bootleg miners, and mine operators, bootlegging has been reduced to a minimum and is expected to be negligible in 1943.

The Pennsylvania Bureau of Mines reports figures of authorized production and of truck shipments. These indicate that the trucks carried 13.4 percent of production in 1941 and approximately the same proportion of the 1942 output. It may be assumed however that in 1943 there will be some decline in the truck figure, even though trucks which formerly were engaged in bootleg operations may be available for the hauling of the authorized output of coal. If the bootleg coal is considered a truck shipment, then it is believed, however, that many of these trucks have already gone to more profitable operations and that the railroads will have to absorb the increase in output of anthracite.

Production in 1943 is estimated at 63 million tons, compared with 59.7 million tons for 1942, an increase of 7.3 percent. At the present rate of operations, however, this figure appears reasonable, but strikes may cause a considerable reduction in total output. However, to remain on the conservative side in anticipating freight requirements, this figure of 63 million tons has been used. By deducting truck shipments, and the coal used by the mines for power and coke, and coal used by employees, a figure of non-rail shipments may be arrived at. This would come to approximately 53 million tons in 1943, as compared with 48.8 million tons in 1942. (See the table below). Beyond this the amount of fuel consumed by the loading carriers themselves must be deducted in order to get revenue tons originated. This figure consumed on line has been decreasing in quantity because of efforts by the carriers to restrict their own use of anthracite, permitting a larger quantity to go to other consumers. This will also tend to increase the percentage of revenue anthracite loaded by the carriers.

A difficulty in estimating ICC loadings of anthracite arises from the two factors: (1) the ICC includes reshipment from breakers as loaded tonnage, (2) the ICC also includes in anthracite about 300,000 tons mined in Virginia, Colorado, New Mexico and several other states. This double billing of anthracite has inflated the ICC figures in recent years particularly, since larger quantities of anthracite are being produced by strip mines which have almost all their output crushed. Strip mining operations have been increasing rapidly in recent years: in 1940, 6.35 million tons; and in 1941, 7.32 million tons were produced by strip mines. When these strip figures are added to the estimated figures of revenue anthracite loadings, the increase of 1941 over 1940 becomes 9.5 percent; this compares favorably with the 9.9 percent increase estimated in the ICC revenue tons loaded figures. Strip mining has continued to expand, so that some further inflation of ICC figures over estimated railroad revenue loadings of anthracite is forecast in 1943. It is therefore estimated that the ICC figures of revenue tons loaded will increase by 9.0 percent in 1943, bringing total rail loadings to 75.6 million tons.

Production and Shipments of Anthracite Coal, 1940-1943 1/
(000 short tons)

	1940	1941	1942	Estimated 1943
Total production	56,485	59,368	60,661	63,000
Bootleg coal (estimated)	5,000	3,000	1,000	250
Total authorized production 2/	51,485	56,368	59,661	62,750
Non-rail shipments 2/				
Trucks	6,192	7,529	7,983	7,700
Employee coal	509	468	500	500
Mine power and coke	2,256	2,261	2,460	2,600
Total	8,957	10,258	10,943	10,800
Rail Shipments (total)	42,528	46,110	48,718	51,950
Rail Fuel (total)	1,379	1,394	1,200	1,000
On line	1,170	1,185	1,020	850
Revenue loadings	41,358	44,925	47,698	51,100
Percent increase		+ 8.6	+ 6.2	+ 7.1
Revenue loadings (ICC)	58,524	64,340	69,350	75,600
Percent increase		+ 9.9	+ 7.8	+ 9.0

1/ Table prepared with the assistance of Mr. John Havener, Fuels Section, Office of Civilian Supply.

2/ Authorized production and truck shipment figures for 1940, 1941 and 1942 reported by Pennsylvania Department of Mines. All other figures estimated by Fuels Section, OCS.

Bituminous Coal

Production of bituminous coal for 1942 is now set by the Bituminous Coal Division at approximately 580 million tons. This represents an increase of 12.8 percent over 1942 (the 580 million ton figure may later be raised as indicated below). The 1942 production is estimated at 600 million tons. However, the present level of output is 12.4 million tons a week; at this rate some 645 million tons would be produced in 1943. But loss of manpower in the latter months of 1943 -- and a possible shortage of transportation in the spring of the year when the Lake season opens -- will curtail production. At present, too, there is a strong possibility of a general strike or a series of strikes in the coal mines which would have a serious effect upon coal production. Requirements for the year are set at 600 million tons, a sizeable increase over the 532 million tons required in 1942; the large increase has been necessitated by conversion to coal, a shortage of anthracite for heating purposes, and additional coking and industrial requirements. Canadian requirements are expected to increase by approximately 2 million tons.

In arriving at a basis for estimating ICC figures of revenue tonnage of bituminous coal, the following process was employed. Statistics of production and shipments of coal by the various carriers are reported in a publication of the Bituminous Coal Division (January 1943). These figures cover production and shipments for 1940 and 1941, and list the individual carriers to which coal was delivered for shipment at the mines or by trucks. In the trucking figures only coal carried to destination from the mines is included. In analyzing rail shipments there were found to be a number of other raods which do not report to the ICC for various reasons, but which haul more than 8 million tons of coal. These carriers are plant facilities, electric railways, raods which do not participate in interstate rates, and other carriers which may not file reports with the Commission. In order to arrive at a figure of revenue loadings, the amount of non-revenue coal hauled by Class I carriers must be deducted, as well as the revenue loadings of other loads which are unknown. Therefore, the tonnage of railroad fuel consumed was calculated by combining the quantity of coal consumed by Class I carriers and of Class II and III carriers as reported to the ICC with an estimate of the consumption of the other railroads relating their fuel consumption to that of Class II and III roads, on the basis of the quantity of bituminous coal which they originate.

No exact figure exists of the amount of fuel which is consumed on the lines of the originated carriers, that is non-revenue coal. It has been estimated by Dr. Julius Parmelee of the AAR that 38 percent of the fuel coal handled by Class I roads is sold to other railroads. This would leave 62 percent of the total fuel requirements of the railroads as non-revenue; this figure has been applied for each year to arrive at a deduction from total loadings to get an estimate of revenue tonnage of bituminous coal originated.

By this process, made explicit in the table below, a figure of 298.5 million tons originated in 1940 was arrived at, a very favorable comparison to the 298.3 million tons reported by the ICC. This comparison, however, is more accidental than actual, because there is undoubtedly some double billing of coal in the ICC figures. (Some of the ex-dock coal unloaded in New York, New Jersey and Wisconsin is reported again in the ICC figures, and some coal classed as bituminous by the Department of the Interior is listed as anthracite by the ICC.) These two forces, however, may cancel out each other and provide some assurance that the figures of revenue tonnage of Class I roads reported by the Commission bearing a real relationship to the revenue tonnage figures computed in the table below from reports of the Bituminous Coal Division and other estimates.

Truck shipments for 1942 have not been reported but preliminary surveys indicate that the trucks lost from 3 to 4 million tons of coal in 1942 on the basis of the percentage handled in 1941. This diversion from truck to rail should be accelerated in 1943, so that out of an expected increase in production of 25 to 35 million tons of coal, the railroads should get from 20 to 25. As indicated below, this would mean an increase of from 6 to 7 percent in revenue loadings of bituminous coal, and a figure of 404.65 million tons of coal be handled by Class I carriers in 1943 has been assumed until such time as revised production figures for 1943, as well as more exact reports for 1942, are forthcoming. The table below indicates the basis upon which this estimate has been made.

While any estimate of production and rail shipments is extremely hazardous at this time, it may safely be assumed that there will be an increase in the average haul of bituminous coal. The most obvious cause is additional diversion from water shipments to New England. In 1941, there were 12,960,000 tons of coal shipped by collier from Hampton Roads; in 1942, 8,159,000 tons, a loss of 37 percent. In the first months of 1943 coal shipments were averaging slightly more than 500,000 tons, indicating that from 2 to 3 million more tons might have to go all-rail to New England. As a matter of fact, all-rail movements to New England ran 30 percent higher in the first quarter of 1943 than for the first quarter of 1942, but such movements far exceeded New England requirements and indicated that New England coal consumers were stocking up, possibly in anticipation of a strike. In addition, another quarter of a million tons are required in the Pacific Northwest which will have to move via the Lakes and by rail from Duluth. It is not believed that the shortage of carrying capacity on the Lakes will affect the amount of coal (estimated at 54,000,000 tons) which will be moved by water, for this is a back-haul for the ore boats.

Bituminous Coal Production and Loadings By Types of Transport

1940 - 1943 (000 short tons) 1/

	Reported 1940 2/	Reported 1941 2/	Estimated 1942 3/	Forecast 1943
Production (U.S. & Alaska)	460,772	514,149	580,000	600,000
Adjustment	0	0	1,600 4/	15,000 5/
Total	460,772	514,149	581,600	615,000

(Con't)

Total Shipments				
Truck 6/	35,541	40,056	42,000 3/	40,000
Conveyor	5,888	6,068	6,300	6,500
Employee coal	2,035	1,872	1,800	1,800
Mine power & coke	6,488	9,629	15,400	17,000
River	29,493	30,240	32,300	34,000
Rail				
Taken by locomotive at tipple	939	1,100	1,300	1,450
All other	380,388	425,184	482,500	514,250
Rail Shipments (excl. coal taken by locomotive at tipple)	380,388	425,184	482,500	514,250
Class I roads	350,586	393,807	448,750	479,000
Class II roads	17,146	19,483	22,200	24,000
Class III roads	3,747	3,755	3,750	3,750
Other roads 7/	8,909	8,139	7,800	7,500
Rail Shipments (incl. coal taken by locomotive at tipple)	381,327	426,284	483,800	515,700
Railroad fuel, total	92,343	104,448	123,300	133,500
Class I roads 8/	87,962)	99,746)	118,200)	128,000
Class II & III roads 8/	3,085)	3,483)	4,000)	4,400
Other roads (estimated)	1,296)	1,219)	1,100)	1,100
Railroad fuel, on line 9/	57,253	64,759	76,450	82,790
Revenue tonnage	324,074	361,525	407,350	432,930
Class I roads 10/	298,539	334,772	378,835	403,490
Domestic production (U.S. only)	460,598	513,910	581,720	614,700
Imports (Canada)	371	319	410	446
Total production & imports	460,969	514,229	582,130	615,146
Percent increase		+ 12.1	+ 13.2	+ 5.6
Revenue loadings (estimated above)	298,539	334,772	378,835	403,490
Percent increase		+ 12.1	+ 13.2	+ 6.5
Revenue loadings (reported by ICC)	298,315	335,195	379,404	404,450
Percent increase		+ 12.4	+ 13.2	+ 6.6

1/ Table prepared with the assistance of Mr. John Havener, Fuels Section, Office of Civilian Supply.

(Con't)

2/ Figures on production and shipments for 1940 and 1941 from "Bituminous and Lignite Coal Tables," U. S. Department of the Interior, Bituminous Coal Division, January 1943. Production figures for 1942 and 1943 from Bituminous Coal Division.

3/ Mine consumption and river shipments reported monthly by Bituminous Coal Division. Truck and other figures estimated. Sample surveys taken by National Coal Association indicate roughly a 5 percent increase in truck shipments for 1942. Dr. Harvey Young of the Bituminous Coal Division concurs with this estimate of a 5 percent increase.

4/ This adjustment made to allow for internal consistencies. The Bituminous Coal Division also states that the official figure of 580,000,000 tons may be raised.

5/ This amount added to the official figures because production is now averaging 12.4 million tons a week. Strikes and manpower shortages may bring this average down, but 615 million tons appears to be a reasonable figure.

6/ Trucked to destination only. Does not include coal trucked to a rail head or water shipping point (in 1941 this amounted to 12.5 million tons).

7/ Electric railways, lines not participating in interstate rates, plant facilities and other roads not reporting to the ICC but listed as hauling coal by the Bituminous Coal Division.

8/ Reported by the ICC for 1940 and 1941. Estimated for 1942 and 1943.

9/ Dr. Julius Parmelee of the Association of American Railroads has estimated coal hauled for other roads at 38 percent of all rail fuel coal carried by Class I roads. This leaves 62 percent as non-revenue coal.

10/ The percentage of revenue tonnage assigned to Class I roads is the same as the percentage of coal which they originate (see Rail Shipments above): in 1940 this was 92.12 percent; in 1941, 92.62 percent. Estimate for 1942 is 93 percent and for 1943, 93.5 percent.

COKE

In the past several years the tonnage of coke handled by the railroads has been increasing at a faster rate than coke production. This fact emerges from the table shown below of coke production and shipments; in 1942 the increase in coke production was 8.8 percent, and in tonnage originated by the railroads, 12.2 percent. In 1941 the disproportion of the rail increase to production was even greater.

The reasons for this are several in number: (1) almost all beehive coke has to move by rail and beehive coke production has been increasing faster relatively than by-product coke production; (2) requirements of the Steel Industry have risen faster than the output of captive ovens, making it necessary for them to purchase coke from utilities and other manufacturers in outlying areas; (3) the diversion of coke from residual to industrial use has caused additional shipments from gas utilities and other producers to industrial consumers, particularly the Steel Industry (for the most part, (2) and (3) are two sides of the same process).

In 1943 the trends described above will continue to operate, with this exception, that beehive coke production will not be increasing at the rate shown in the past few years. The reason for this is that many old beehive ovens have been brought back into production, have had to be relined and a few of these have lost nearby supplies of coal. It had been hoped to bring beehive capacity up 9 million tons, but at the present rate of operations their output will fall substantially below this figure. The diversion of coke from residential to industrial use is continuing; approximately 150,000 tons a month are being diverted and if this tonnage, in addition to the increase expected in beehive coke, is added to the figure of rail tons originated in 1942, an increase of from 9 to 10 percent is indicated.

Carloadings of coke through April 24, 1943, were running 6.1 percent higher than for the same period in 1942; taking into consideration the heavier loading of coke, this would indicate an increased tonnage of approximately 7.5 percent. Therefore, an estimated increase of 9 percent in the tonnage of coke shipments by rail does not appear unreasonable.

Coke Production and Rail Shipments, 1940-3
(Short Tons)

	1940	1941	1942	Estimated 1943
Production (000 tons) 1/				
By-product	54,014	58,414	62,233	66,126
Beehive	3,058	6,352	8,222	8,550
Total	57,072	64,766	70,455	74,676
Percent Change		+ 13.5	+ 8.8	+ 6.0
Rail Tonnage (000)	15,824	19,980	22,412	24,430
Percent Change		+ 26.3	+ 12.2	+ 9.0

1/ Figures for 1940, 1941 and 1942 reported by the Bureau of Mines.

IRON ORE

About 95 percent of the tonnage of iron ore is carried by Class I railroads at one time or another. The 1942 figures of production of iron ore as reported by the Bureau of Mines are still preliminary but they show an increase of 13.5 percent. These figures do not include the production of sinter and useable iron ore in the Pennsylvania region in 1942 and consequently are not strictly comparable with 1941. In addition, the Bureau of Mines is converting from a long-ton to a short-ton basis of reporting, and further changes in the figures are to be expected. Production for 1940 and 1941, and the preliminary figures for 1942, are shown in the following table, along with the railroad tonnage.

Production and Shipments of Iron Ore, 1940-3

	1940	1941	1942
Production (Long Tons) 1/			
Superior	61,470,725	78,858,285	91,012,000
Birmingham	6,890,193	7,202,264	8,850,000
Chattanooga	250,419	447,229	585,000
Adirondack & Cornwall	2,899,986	3,300,451	2,350,000
New York & New Jersey	659,425	649,374	608,000
Other	1,525,151	1,951,976	1,478,000
Total	73,695,899	92,409,579	104,883,000
Production (Net Tons)	82,539,400	103,498,730	117,469,000
Percent Change		+ 25.4	+ 13.5
Tons Originated by Class Class I Railroad 2/	78,383,221	100,121,663 + 27.7	112,031,780 + 11.9

1/ Reported by the Bureau of Mines, U. S. Department of Interior.

2/ Reported by the Interstate Commerce Commission.

Looking at the 1942 statistics, it appears that 14 million additional short tons of iron ore were produced during the year, but the railroads carried only 11.9 million tons more than they did in 1941. What happened to the 2 million tons of iron ore that were produced in 1942 but not reported in the rail tonnage figures? Investigation reveals that this quantity was not added to mine stocks for the latter increased by only a little more than 100,000 tons. Even if 2 million tons had fallen off the ore boats in transit -- which they did not -- it would not show up in the figures which are supposedly originated tonnage at the upper end of the Lakes.

Supposedly is used deliberately, for it gives a clue to the situation. For after years of diligent research and investigation, the ICC discovered that railroads at the lower end of the Lakes were reporting iron ore as originating on their lines. Here are some examples.

Carrier	Tons of Iron Ore Originated, 1941 1/
Bessemer & Lake Erie	767,000
Pennsylvania R. R.	115,000
Norfolk & Western	79,000
Pittsburgh & Lake Erie	54,000
Chesapeake & Ohio	12,000

1/ Since we imported 257,000 tons from Canada in 1941, some of the ore tonnage might be correctly reported.

However, the major reason for the failure of Class I carriers to maintain their percentage of iron ore traffic, is that most of the Southern ore carried by rail is not reported to the ICC. In the Birmingham District more than 85 percent of the iron ore is produced in captive mines and hauled by plant facilities. One producer, the Tennessee Coal & Iron Company, mined

4,189,000 tons of crude and usable ore in 1941 and 4,889,000 tons in 1942. The company railroad does not file a report with the Commission. This would account for another 1,000,000 tons not included in the ICC figures.

It seems clear at this time that there will be very little increase of iron ore handled by Class I roads. The opening of the Lake season has been delayed about four weeks beyond the date of last year's opening, and during the first four weeks of 1942 the Lake boats carried more than 8 million long-tons of ore. Even with the new colliers coming into operation*, it is doubtful whether more than 90,000,000 tons or ore can be brought down from the head of the Lakes this year. The exact tonnage to be carried by ore boats is, of course, a matter of policy, The Steel Division has asked for 94 million tons of capacity, but satisfaction of this request would mean the exclusion of 4 or 5 million tons of grain, limestone and other commodities.

Assuming--optimistically--that the Lake boats will carry 91 million tons of ore, any increase in rail tonnage will have to come from the all-rail haul of Superior ore, the gain in Eastern and Western Magnetite and the increase in "other" ore production, most of which comes from Missouri (see table below). Statistics of shipments of iron ore for 1941, 1942, and estimates for 1943 have been furnished by the Steel Division of WPB**.

* Eight of these boats are expected to be ready by June 1, 1943, and eight later in the season.

** These figures differ slightly from those of the Bureau of Mines since they cover shipments and not production.

Shipments and Rail Loadings of Iron Ore, 1941-3

	1941	1942	1943
Shipments (Gross Tons)			
Superior (Rail & Water)	80,116,360	92,085,324 1/	91,000,000
Superior (All-Rail)	1,093,967	1,410,568	2,235,000
Southern	8,132,175	9,469,643	9,500,000
Eastern Magnetite	3,260,000	3,936,607	5,489,000
Western Magnetite	1,394,389	1,477,679	3,700,000
Other	13,410	50,513	1,050,000
Total (Gross)	94,010,291	108,430,334	112,974,000
(Net)	105,291,500	121,442,000	126,530,800
Percent Increase		+ 15.3	+ 4.2
Class I Carriers	100,121,663	112,031,780	116,500,000
Percent Increase		+ 11.9	+ 4.0

1/ Reported by Great Lakes Shippers' Association. Includes manganiferous ore. Excluding the slight gains expected to be registered in shipments of Southern ore, the increase in the tonnage which the Class I roads will handle should be no more than 4 or 5 million short tons. As indicated above, the total tons originated of iron ore are expected to be 4 percent greater than in 1942.

COPPER ORE AND CONCENTRATES

It is estimated by the Non-Ferrous Metals Section of the Office of Civilian Supply that approximately 4,300,000 tons of concentrates were produced in 1942, compared with 3,900,000 tons in 1941, a 10 percent increase. The Bureau of Mines reports copper ore production at 92,530,000 tons for 1942, and 78,184,000 for 1941. This shows an increase of 18 percent in ores, indicating that lower grade copper ore was being mined in 1942. Class I railroads, however, originated 5 percent less tonnage in 1942 than they did in 1941.

It is believed that the explanation for the trend in rail shipments is as follows: (1) Most of the rail tonnage of ores and concentrates is carried by Class II and Class III railroads (Class II railroads originated 2,294,000 tons in 1941), or by railroads which do not report to the Commission. Much of the Class II or III tonnage is terminated by Class I railroads (see table below for figures) and tonnage terminated increased slightly in 1942. (2) Production of copper ore, concentrates and refined products is closely controlled, with one large company owning mine, mill and smelter and moving most of its tonnage by plant facilities. Copper ore hauled by Class I railroads includes shipments by small mines to mills and smelters, and many of these small mines either went out of business in 1942 or suffered losses in production. The greatest expansion took place in the mines owned by large companies and some of the transportation facilities involved, such as the Butte, Anaconda and Pacific Railroad, do not report to the Commission. Ore production in the Butte district increased by 13 percent in 1942. The Bingham & Garfield, a large copper carrier located in a region where production has been expanding, is a Class II road and its loadings therefore are excluded from the Class I figures.

In 1943, a 14 percent increase in the production of ores and concentrates has been estimated by the Copper Division. Additional efforts are being made to keep the small mines in production, but it is feared that there may be a continued loss of production of these mines; consequently, tonnage originated by Class I carriers should not increase as much as ore production. Therefore, it is estimated that the Class I carriers will handle 6 percent more copper ore and concentrates in 1943 than they did in 1942.

The one-day studies indicate that approximately 96 percent of this class is represented by ore and only 4 percent by concentrate; this agrees with the estimate of the Copper Section that it requires on the average from 20 to 30 tons of ore to make one ton of concentrate, since the domestic ores are generally low grade. Imports of ores and concentrates are not large enough to affect the rail figure significantly, but are estimated at from 70,000 to 80,000 tons for 1941, 1942 and 1943.

Production and Rail Shipments of Copper Ore and Concentrates, 1941-3 1/

(Short Tons)

Production	1941	1942	Estimated 1943
Refined Copper	975,400	1,072,300	1,200,900
Concentrates (Est.)	3,900,000	4,290,000	4,800,000
Ores 2/	78,184,000	92,530,000	105,600,000
Percent increase in ores		+ 18.3	+ 14.1
Tonnage originated by Class I carriers	1,644,541	1,562,406	1,656,000
Percent increase		- 5.0	+ 6.0
Tonnage terminated by Class I carriers	4,917,034	4,993,387	5,493,000
Percent Change		+ 1.6	+ 10.0

1/ Prepared with assistance of Non-Ferrous Metals Section, Office of Civilian Supply.

2/ Reported by the Bureau of Mines.

LEAD ORE AND CONCENTRATES

Total mine production of recoverable lead in 1942 is estimated by the Bureau of Mines at 106.7 percent of the 1941 figure; the weight of lead and zinc ores is estimated at 107.1 percent of 1941. The rail tonnage increased 9 percent indicating a close relationship between rail shipments and production.

The ODT one-day studies indicate that of the rail carloads about 40 percent were ore and 60 percent were concentrates. Part of the ore comes from small mines which do not have their own smelters. There is a small tonnage of concentrate and bullion imported, but most of this is refined at tidewater and does not require rail haul.

Mine production of recoverable lead and the mining of lead and zinc ores are estimated from 6 to 10 percent lower in 1943. Production in mines is dropping off and it is believed that rail shipments in 1943 will follow this trend and decline 7 percent below the 1942 level.

Production and Rail Shipments of Lead Ore and Concentrates
1941-1943

	1941	1942	Estimated 1943
Total Mine Production (Recoverable Lead)	461,426	492,435	450,000
Percent Change		+ 6.7	- 8.6
Weight of Concentrates	612,963	654,150	598,000
Percent Change		+ 6.7	- 8.6
Weight of Lead (& Zinc) Ores	35,183,520	37,667,988	35,300,000
Percent Change		+ 7.1	- 6.3
Rail Tonnage	617,729	673,167	626,000
Percent Change		+ 9.0	- 7.0

ZINC ORE AND CONCENTRATES

Domestic production of recoverable zinc was only slightly higher in 1941 than in 1942 and the mining of lead and zinc ores increased only 7 percent, however, railroad tonnage increased by 25.5 percent. The following factors are believed to be responsible for this discrepancy. (1) Imports of concentrates increased from 246,000 tons (recoverable zinc equivalent) to 441,000 tons, a jump of nearly 80 percent. The increase of imports come largely from Canada and Mexico, and these concentrates have to be brought in by rail. (2) There was considerable movement of concentrates within the country to assure a larger output of high grade zinc; thus a high grade of concentrates might be transferred from the mill close at hand to another which might be able to produce a higher grade of metallic zinc. (3) Many small mines were brought back into operation in 1942 and had to ship their ores to large mills.

As previously mentioned it is expected that production of zinc and lead ore will fall in 1943. Manpower shortages are beginning to affect production, although it is hoped through a higher price to enable producers to hold their labor. The following table shows average monthly production of ore and lead concentrates in 1941, 1942, and the first two months of 1943.

Production of Lead, Zinc and Ore
1941, 1942 & First 2 Months 1943 1/

	1941 Monthly Average	1942 Monthly Average	1943 January	1943 February
Lead & Zinc Ore	2,931,921	3,138,999	2,917,889	2,316,875
Lead	35,547	38,925	34,295	33,098
Zinc	64,085	62,666	58,608	54,085

1/ Reported by Bureau of Mines

On the other hand imports will probably continue to increase, particularly those coming from Canada, Australia, Mexico, and South America. It is believed that these may amount to a total of 560,000 tons (recoverable zinc content) in 1943. Total tonnage of concentrates are estimated at 107 percent of 1942 and the rail shipments have been increased by 10 percent.

Production & Rail Shipments of Zinc Ore & Concentrates
1941 - 1943
(Short Tons)

	1941	1942	Estimated 1943
Domestic Production (Recoverable Zinc)	749,150	760,210	720,000
Imports	245,813	441,231	560,000
Total Zinc (& Lead) Ore 1/ Mined in U.S.	35,183,520	37,667,988	35,300,000
Percent Change		+ 7.1	- 6.3
Total Concentrates (Est.)	2,128,260	2,569,930	2,748,660
Percent Change		+ 20.8	+ 7.0
Rail Shipments	2,495,163	3,129,492	3,442,000
Percent Change		+ 25.4	+ 10.0

1/ Reported by the Bureau of Mines for 1941 and 1942 (preliminary).

Ores and Concentrates, NOS

This is a heterogeneous class of ores, concentrates and oxides the composition of which is difficult to assay from the standpoint of transportation. The one-day studies indicate that some of the more prominent members of the class are bauxite, alumina, chromite, cryolite and manganese; but as is so often the case, the most important personnage is Mr. Noibn who travels incognito all up and down the ICC classification. As may be seen from the following table, unspecified ores and concentrates account for two-fifths of all carloads caught by the one-day studies.

Item	Percent of Total Carloads
Bauxite	31
Alumina	6
Chromite	9
Cryolite	2
Manganese	13
Ores & concentrates, noibn	39

Some of the ores and concentrates which can be identified as belonging to this class are barite, titanium, vanadiu, cobalt, zirconium and milybdenum. It seems likely also that zinc oxide, calcium fluoride and tin concentrate (cassiterite) are included here since there is no place else for them to go this side of Class 701, the grand catch-all. What is not so clear is whether any of the ferro-alloys reported in 701 indicates that they represented less than .6 of 1 percent of the total, an estimated 450,000 tons. But in 1942 the production of ferro-manganese, ferro-chrome, ferro-silicon and ferro-titanium amounted to more than 2,000,000 tons, most of which the Ferro-Alloy Division, WPB, estimates moved by rail. Consequently, it is believed that there is a substantial tonnage of these alloys in this class.

But the missing ores and concentrates which undoubtedly account for a large part of the noibn tonnage of this class, are the salicious gold and silver ores. While most gold and silver come from lead, zinc and copper ores, there is a substantial tonnage of dry ores--the Bureau of Mines estimates 13,160,000 tons in 1941--some of which are shipped as ores and some as concentrates to smelters.

Statistics furnished by the various Metals and Minerals Divisions of WPB and by the Bureau of Mines indicate that notable increases occurred in the production of bauxite and alumina in 1942, also larger quantities of cryolite, molybdenum and zirconium were mined and imported. On the other hand, new supplies of the ferro-alloys, with the exception of ferro-silicon, were smaller in 1942 than in 1941. A decline estimated at 15 percent occurred in the case of the salicious gold and silver ores, largely because of the limitation order issued by the Mining Division affecting operation of the larger mines. Production of barite ore and barium chemicals dropped off reflecting trends in the paint industry. Altogether, it is estimated that total production of Ores and Concentrates, NOS, increased 11 percent in 1942, compared to a 10.9 percent increase in rail tonnage originated.

Most of the trends visible in 1942 will continue to affect production of these ores and concentrates during the coming year. The output of domestic bauxite is expected to be doubled, while imports of high-grade Guyana ore will rise only slightly. The flow of bauxite will reach a maximum in August and should then level off at about 400,000 tons a month by rail. The output of alumina is expected to rise nearly 80 percent in 1943. Gains will be registered in the production of cryolite, antimony, titanium ore and oxide, and ferro-silicon; manganese ore and concentrate will hold its own and a substantial decline is expected in chrome and ferro-chrome. Mining of dry gold and silver ores is expected to decline further, since many mines will be closed down. Some of these have been granted exceptions to Limitation Order 208 because it was hoped to increase supplies of tungsten, arsenic, lead, zinc and silver mined along with the gold and silver. First quarter reports for 1943 show that consumption of barium chemicals (ground barite, oxides and sulfate) is running about 10 percent below last year's levels.

The following table indicates production of the various ores and concentrates involved here for 1941, 1942 and 1943. This does not represent an exact picture of shipping requirements, though most of the tonnage does have to be moved. Some of the items are transported several times, first as ores, then as concentrates: for example, natural cryolite is imported into this country as a crude ore; after refining, it is again shipped as cryolite at 70 percent the weight of the original ore. On the other hand, some of the imports of ores and concentrates are refined at tidewater and never require transportation; this is true of much of the tin concentrate imported from South America. Figures for the gold and silver ores represent only shipping requirements for these ores--total production is more than 13,000,000 tons. Since sinkings may interfere with the large tonnage of imports included in the 1943 figures, it is estimated that rail shipments will increase by something less than expected supply.

Production of Ores and Concentrates, NOS, 1941-3
(Short Tons)

	1941	1942	Estimated 1943
Bauxite	2,288,000	3,886,000	7,248,000
Alumina	822,000	1,029,000	1,897,750
Barite (crude)	503,160	432,000	388,800
Barium chemicals	245,950	209,060	177,700
Cryolite (synthetic, crude, natural)	59,150	160,000	182,000
Manganese	1,664,000	1,514,100	1,534,000
Ferro-manganese	641,220	586,920	594,730
Chromite	1,130,000	1,090,880	784,000
Ferro-chrome	657,660	605,700	313,600
Titanium	198,750	88,200	300,000
Ferro-silicon	677,560	758,540	942,590
Zinc oxide	210,700	164,100	145,000
Calcium fluoride	103,630	99,360	115,000
Molybdenum	18,700	27,700	32,250
Zirconium	19,000	26,750	19,850

(Con't)

Kyanite	14,300	7,050	12,000
Tungsten	9,700	10,850	14,000
Cobalt	2,800	2,050	2,700
Vanadium	1,700	2,440	3,200
Tin concentrate	32,110	33,570	37,300
Antimony	43,300	44,600	65,000
Gold & Silver Salicious Ore	1,020,000	850,000	765,000
" " " " concentrate	960,000	816,000	734,000
Total	11,407,590	12,485,650	16,428,470
Percent Change		+ 9.5	+ 31.6
Rail Tonnage	6,682,896	7,412,746	9,637,000
Percent Change		+10.9	+ 30.0

SAND AND GRAVEL
(Other than Glass or Molding)

An unusually heavy tonnage of sand and gravel was hauled by rail in 1942, and a substantial volume of these aggregates traveled several hundred miles from producer to consumer. The Interstate Commerce Commission reports the tonnage of sand and gravel carried by the railroads at more than 76 million tons, compared with nearly 50,000,000 tons in 1941, an increase of 52.6 percent. And a check of waybills on cars included in the ODT one-day studies reveals that 30 percent of the cars carrying sand and 12 percent of those hauling gravel covered distances in excess of 100 miles, some of them traveling as far as 600 miles. Normally the average haul for sand and gravel is somewhere between 50 and 60 miles.

It is certain that production of sand and gravel did not increase at anything like the rate at which rail loadings increased. While tabulation of reports by the Bureau of Mines is not complete, spot checks indicate that total production probably increased in the neighborhood of 10 percent. As indicated below this figure includes production of molding and glass sands which are not included in Class 350; but they are a relatively small part of sand and it seems reasonable to suppose that their production also increased about 10 percent in 1942 (see Class 392, Products of Mines, NOS). Measured in terms of dollar value, the volume of construction was 20 percent greater in 1942 ($13,355,000 as compared with $11,129,000 in 1941). A better index of the demand for aggregates is cement production: this increased only 11.4 percent in 1942, and the quantities used by various classes of consumers are shown in the following table:

Production and Use of Sand and Gravel, 1941, Estimate for 1942

Sand	1941
Glass	3,475,111
Molding	7,246,081
Fire and furnace	325,803
Building	40,164,731

(Con't)

Paving	3,475,111	
Grinding & polishing	1,001,814	
Engine	2,022,782	
Filter	263,966	
Railroad ballast	1,634,335	
Other	2,022,604	
Total Commercial Sand	85,170,510	
Gravel		
Building	37,900,243	
Paving	38,310,304	
Railroad ballast	16,302,175	
Other	3,873,325	
Total Commercial gravel	96,385,957	
Total Sand and Gravel	181,556,467	
Building and Paving	143,388,561	tons -- 79.0%
Railroad Maintenance (Ballast, Filler)	19,445,604	tons -- 10.7%
Molding, Glass, Furnace Sand	11,046,995	tons -- 6.1%
Other	7,675,307	tons -- 4.2%
Non-revenue Railroad Sand & Gravel	7,574,502	tons or 39% of all railroad sand and gravel

Total Commercial Sand & Gravel - 1941 - 181,556,467 tons
Estimated 1942 - 200,000,000 tons

It is not very difficult to establish the reasons for this sharp increase in rail transportation of sand and gravel. For one thing, the shift from civilian to military construction brought about a decline in commercial road building which is handled largely by truck out of local sand and gravel pits. Military projects mushroomed at places where the normal supplies of aggregates were inadequate, requiring movements of these materials from outlying sources of production. There is considerable evidence to indicate that lack of coordination in the planning of projects among various government agencies result in the clustering of projects in some areas creating a demand far in excess of the supply of sand and gravel. Sudden decisions made in regard to new construction gave no opportunity for stockpiling and other means of averting local shortages. Because of the urgency of completing the work, contractors sought to assure themselves of ample supplies of aggregates by ordering from near and far.

Accordingly, much sand, gravel (and crushed stone) which ordinarily would have been carried by truck, moved by rail during the past year. While approximately 29% of commercial sand and gravel (excluding molding, glass and furnace sand) moved by rail in 1941, it may be roughly calculated that slightly more than 40 percent moved by rail in 1942.*

* The Bureau of Mines reports that of all commercial and non-commercial sales of sand and gravel in 1941, 67 percent moved by truck, 25 percent by rail and 8 percent by waterway.

All indications point to a substantial decline in construction in 1943. Dollar value of construction is estimated by the Tariff Commission at $7,550,000 for 1943, compared with $13,355,000 in 1942, a decline of 43.5 percent. Shipments of cement are expected to decline by at least 30 percent in 1943 (see Cement under Manufactures and Miscellaneous). The National Industrial Conference Board reports that there were 16 percent fewer construction workers in February 1943 than in February 1942, and contracts let during the month were valued at about one-half of last year's awards.

With such a decline in construction it may safely be assumed that total shipments of aggregates will decline by at least 30 percent. Furthermore, it is likely that construction will be less hectic and better organized than in 1942, permitting local producers to meet the demand for sand and gravel in their vicinity. A resumption of normal conditions in the movement of aggregates would tend to increase the percentage of truck relative to rail shipments. The use of sand and gravel in railroad maintenance operations will probably remain constant, and there should be little change in the quantities of sand required for other uses which include engine sand and sand used for grinding or polishing. Sand and gravel used for other purposes than construction, account for 30 million tons or about 23 percent of commercial production of sand and gravel (excluding glass, furnace and moulding sand). As shown in the tables below, it seems reasonable to conclude that total production of sand and gravel for the uses described will decline 30 percent and that the tonnage originated by Class I carriers should decline 32 percent.

Production of Sand and Gravel	1941	Est. 1942	Est. 1943
Building and paving	143,388,561	157,750,000	102,537,500
Railroad Maintenance	19,445,604	21,390,000	21,390,000
Other	7,675,307	8,460,000	8,460,000
Total	170,509,472	187,600,000	132,387,500
Percent Change		+ 10.0	- 29.4
Rail Tonnage	49,853,115	76,097,615	51,746,000
Percent Change		+ 52.6	- 32.0

BROKEN, GROUND OR CRUSHED STONE

Substantially the same conditions prevailed in the production and shipments of crushed stone as have been described for sand and gravel. Class I railroads originated 38,471,000 tons of crushed stone in 1942, a 51.6 percent increase over 1941. This compares with the 52.6 percent increase in sand and gravel shipments by rail. It is not believed that the production of crushed stone increased by anything like this percentage; a spotcheck of several producers reveals that the output of crushed stone was probably about 10 percent greater in 1942. Total crushed or broken stone produced in the United States as reported by the Bureau of Mines came to

181,161,980 tons in 1941. This excludes, of course, any limestone used in the manufacture of cement or lime. Of this figure of 181,161,980 tons, 126,116,550 tons would be included in Class 351, Crushed Stone and the remainder--largely limestone--would move in Class 392, Product of Mines, NOS. In 1941 limestone represented 73 percent of all crushed stone (excluding the quantity used for making cement and lime). The following table shows the quantity of crushed rock used by various industries.

Use	Tons Used in 1941	Percent of Total
Concrete and Road Metal	110,192,610	60.8
Railroad Ballast	10,771,300	5.9
Riprap	5,152,640	2.8
Metallurgical	27,436,440	15.1
Agricultural	11,909,640	6.6
Alkali Works	5,888,260	3.3
Refractory Stone	2,254,120	1.2
Other	7,555,970	4.2
Total	181,161,980	100.0

Of the 126,116,550 tons of concrete and road metal, railroad ballast and riprap which would be classed by the railroads in Class 351, Crushed Stone, the Class I railroads hauled 25,379,518 tons in 1941, or 20.1 percent.* Assuming a 10 percent increase in the production of crushed stone in 1942, the tons originated by the Class I railroads in 1942 represented 27.7 percent of total production.

The factors responsible for increasing rail shipments of crushed stone out of proportion to the upswing in construction in 1942 are essentially the same as those analyzed in the discussion of sand and gravel. Similarly, the output of crushed stone should decline along with other aggregates. The use of riprap has been declining for some years, and it is expected to share in the anticipated 35 percent decline in construction, along with rock used for concrete and road metal. On the other hand, the tonnage of crushed stone used for railroad ballast should hold at about the same level. As shown below, the entire production of crushed stone is expected to decline 32 percent, and rail loadings, 35 percent.

	1941	1942	Est. 1943
Concrete & Road Metal	110,192,610	121,200,000	78,780,000
Railroad Ballast	10,771,300	11,850,000	11,850,000
Riprap	5,152,640	5,000,000	3,200,000
Total	126,116,550	138,050,000	93,830,000
Percent Change		+ 9.4	- 32.0
Rail Tonnage	25,379,518	38,470,930	25,000,000
Percent Change		+ 51.6	- 35.0

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* The Bureau of Mines reports that of 75.6 million tons of concrete and road metal transported in 1941, 65 percent went by truck, 23.9 percent by rail, 6.2 percent by waterway and 4.9 percent unspecified.

ROUGH STONE, NOS

According to the Bureau of Mines the term rough stone applies to rough dimesion stone which are unfinished slabs or blocks of stone most of which are cut to definite shapes and sizes. According to the ICC and railroad freight agents, rough stone, while theoretically the same as dimension stone, can be also sand and gravel, crushed stone, fluxing stone and anything that might gather moss.

The first thing to be noted in connection with this class is that the reported figure of tons originated exceeds total production of dimension stone as reported by the Bureau of Mines. In 1940 the Bureau of Mines reported an output of 2,206,000 tons including about 280,000 tons of finished stone. The railroads outdid themselves by originating 2,640,000 tons. In 1941, Bureau of Mines calculated that the production of dimensional stone had declined 6 percent to a total of 2,028,000 tons. The railroads surpassed all expectations by hauling 3,718,000 tons of rough stone, an increase of 40 percent.

Checking most of the carloads classed as rough stone on the September one-day study it appears that there were 37 cars moving from Monarch, Colorado, to Minnequa, Colo., the site of the Colorado Fuel & Iron Company smelter. This was obviously fluxing stone. Some cars of limestone were moving to California from Arizona despite the fact that Arizona produces not a single carload of rough stone a year. Thirty-nine cars of rough stone--in this case dolomite--were moving from Millville, West Virginia to the Pittsburgh area. Fifty-eight carloads of paving stone were moving from Dougherty, Oklahoma, where there are located two large producers of sand and gravel. The Malvern, (Ark.) Sand and Gravel Company was also shipping paving stone around.

It must be concluded that nothing can be concluded from the ICC figures. In 1942 tonnage originated declined 20 percent below the 1941 level. It is known that the use of dimensional stone has been declining rapidly in the last two years because of the use of other less costly materials in construction and because of the cut in new dwelling construction.

This downward trend will probably continue in 1943, and as has been estimated above, there should be a 35 percent decline of all construction. How much sand, gravel, crushed stone and fluxing stone will be included as rough stone is difficult to estimate, but despite absence of such information, it is belived that the tonnage of rough stone should decline 40 percent in 1943.

Production and Rail Shipments of Rough Stone, 1940-3
(Short Tons)

	1940	1941	1942	Estimated 1943
Production	2,261,180	2,127,970	1,700,000*	1,020,000
Percent Change		- 6.0	- 20.0	- 40.0
Rail Tonnage	2,640,398	3,718,013	2,963,785	1,778,000
Percent Change		+ 40.8	- 20.0	- 40.0

* Estimate

FINISHED STONE

This class includes dressed, finished, hammered and polished rock used for buildings and monuments. It is reported by the Bureau of Mines under dimensional stone, since it comes largely in blocks and slabs. The chief kinds of stone involved are granite, marble and limestone. Total tonnage of production came to approximately 280,000 tons in 1941, divided as follows:

	Building	Monumental
Granite	25,080	42,580
Marble	59,000	1,000
Limestone	160,440	---
	244,520	43,580

Of this quantity the railroads carried 217,000 tons in 1941, but in 1942 their loadings declined slightly, to 212,000 tons.

The use of this finished stone has been declining despite the increase in building, because such stône is employed chiefly in residential dwelling construction. Defense projects consume copious quantities of sand, gravel and crushed stone but very little dimensional stone, either rough or finished. The use of monumental stone should remain fairly constant, but because of the drop in building in 1943, the entire class is estimated at 80 percent of the 1942 level.

CRUDE PETROLEUM

Crude petroleum and asphalt are listed as Products of Mines, while fuel oil, gasoline, lubricating oil and other petroleum products are listed under Manufactures and Miscellaneous. The reason for this distinction is not very obvious. All of these products are claimants of tank car capacity and most asphalt is as much a petroleum product as gasoline or lubricating oil.

From the standpoint of transportation it is preferable to consider crude oil and all petroleum products together since they are all competitors for transportation capacity. So far during the war this is the only group of products whose production and consumption have been limited by the availability of transportation. Consequently, an estimate of the amount of petroleum products that will be carried is based not upon production or requirements for consumption, but upon the capacity of the carrying agencies.

In 1942 there was an 18 percent increase in the volume of petroleum products handled by rail. The increase in ton-miles was, of course, much greater. Average haul of petroleum products jumped from 400 miles in 1941 to 900 miles in 1942 (based on AAR figures of carloadings and car-miles) as the tank cars were diverted to the long movements of the District I; and revenue ton-miles increased from 27,730 million to 73,635 million (165%), accounting for 30 percent of the increase in all railroad ton-miles. The following table shows tons of crude petroleum and petroleum products originated in 1941 and 1942.

Tons & Ton-Miles of Petroleum Products Originated By Class I Carriers In 1941 and 1942

Tons

Crude Petroleum	7,317,674	21,179,792
Asphalt	6,652,273	5,860,945
Gasoline & Refined Products	36,217,258	30,443,361
Fuel & Road Oil	14,573,477	19,290,092
Lubricating Oils	4,179,440	4,642,176
Petroleum Products, NOS	383,560	401,771
Total	69,323,682	81,818,137 (+18.0%)
Ton-miles of all petroleum Products	27,730,000,000	73,635,000,000 (+165.0%)

As can be seen from the above figures the chief beneficiary of the greatly expanded tank car movement has been crude petroleum. This has been a necessary result of tanker losses and the requisitioning of oil tankers by the Armed Services. In order to keep East Coast refineries operating, if only at 65 percent of capacity, it has been necessary to haul large quantities of crude oil from the Southwest and Midwest to District I by tank car. This fact has little relationship with total production of crude oil which is estimated by the Bureau of Mines at 1,385,479,000 barrels in 1942 compared with 1,404,182,000 barrels in 1941, a decrease of 1.4 percent.

Shipments of petroleum by tank car were twice as high in the third quarter of 1942 as they were in the first quarter, but declined slightly in the fourth quarter as did the total volume of petroleum products carried by rail. The following figure indicates revenue tons carried in 1941 and 1942 by quarters.

Tons of Crude Petroleum Originated by Class I Railroads, 1941 and 1942 by Quarters

	1941	1942
First Quarter	1,070,101	3,270,748
Second Quarter	1,234,793	5,231,500
Third Quarter	2,055,707	6,541,924
Fourth Quarter	2,958,423	6,135,620

It seems likely that there will be a large flow of crude oil shipments maintained throughout the year to the East Coast. If the loading figure for the third and fourth quarters of 1942 were kept constant during 1943, an increase of from 20 to 25 percent would result. Crude oil requirements are estimated at 4,850,000 barrels a day compared to 4,140,000 barrels a day in 1942, a 17 percent increase. Eastern refineries still have unused capacity and will require more overland shipments of crude oil in 1943, since it is planned to requisition practically all the East Coast tankers for military use. Crude oil is now being pumped through the War Emergency Pipeline and tank cars are hauling oil between Norris City, Illinois, the present terminus of the line, and Eastern refineries. This means that crude oil shipments will be particularly large in the second quarter of 1943. There should be some decline when the pipeline is completed to the Philadelphia area, but it may be expected that many of the tank cars will be put back in long haul service to bring additional crude oil, fuel oil and gasoline to the East Coast. It is, therefore, estimated that there will be a 20 percent increase in the tonnage of crude oil originated in 1943, bringing the figure of revenue tonnage to be originated to 25,416,000.tons.

ASPHALT

Asphalt is divided into two main classes, natural and petroleum. Natural asphalt is derived from a bituminous rock mined largely in the Ohio Valley area, which is ground, mixed and spread without heating to form a surface. Petroleum asphalt is a by-product of refining and is generally heated before being laid as a surface. The production of petroleum asphalt is approximately ten times as great as that of the natural asphalt. It should be pointed out that, while the petroleum asphalt is classed entirely by the railroads in Class 370, a substantial part of the bituminous rock finds its way into Class 392, Products of Mines, NOS. Thus, no very exact comparison of production and rail tonnage is possible.

The Bureau of Mines reports that 935,000 tons of petroleum asphalt rock were mined in 1942, a 43 percent increase over the 1941 figure. At the same time the output of petroleum asphalt declined from 6,558,000 tons to 6,296,000 tons, a decrease of 4 percent. The reason for the large increase in mining of the rock may be ascribed to the expansion of construction in the Ohio Valley area, shortages of petroleum asphalt or of transport facilities to secure petroleum asphalt, and the fact that a high freight rate on the rock does not deter war contractors as much as it does civilian contractors. On the other hand petroleum asphalt must compete for its production with gasoline and fuel oil, both of which have been regarded as more essential, particularly on the Eastern Coast. It is in District I that the greatest drop in asphalt has taken place, while west of the Mississippi, especially in California, production has been higher than in 1941.

It will be noted that rail shipments of Class 370 in 1942 declined approximately 12 percent. How much asphalt was transported in Class 392 is not known, but probably there was an overall decline in rail shipments. This decline was occasioned by the fact that there was a general shortage of transportation capacity, particularly of tank cars which normally handle more than 90 percent of the production of petroleum asphalt. PAW Distribution Order No. 3 (January - April 1943) cut down on manufacture of asphalt by East Coast refineries and shipments into District I. Exceptions were granted but many small shipments were forced into containers and boxcars, allowing more capacity for fuel oil transportation in heated tank cars. This order expired April 1 and has not been renewed. At present, production of asphalt is running at last year's level of 400,000 tons a month. It is unlikely that this will go as high as the 600,000 tons a month which obtained in the latter part of 1942. It should be pointed out, however, that PAW estimates asphalt requirements in 1943 at about 110 percent of the 1942 level.

Road maintenance was in many cases postponed last year and is expected to make up for the decline of asphalt required for new roads and airport runways. The PAW order undoubtedly cut down on asphalt shipments for the first quarter, and it is believed that for the year there should be a decline of 5 percent in production and 15 percent in rail shipments.

Production and Rail Shipments of Asphalt, 1941-3
(Short Tons)

Production	1941	1942	Estimated 1943
Natural asphalt	654,690	935,000	850,000
Petroleum asphalt	6,557,600	6,296,500	6,100,000
Imports (incl. natural)	158,400	142,500	100,000
Total	7,370,690	7,374,000	7,050,000
Percent Change			- 5.0
Rail Loadings	6,652,273	5,860,945	4,982,000
		- 11.9	-15.0

SALT

Total salt production in 1941 aggregated 12,720,629 tons, of which rock and evaporated salt came to 5,949,193 tons. Of this total tonnage of dry and evaporated salt, Class I carriers originated 3,440,000 tons, or 58 per cent. In 1942, the output of rock and evaporated salt rose to 6,070,185 tons, an increase of 2 percent, (one large producer not yet reported); at the same time Class I handled 3,800,564 tons of salt, or 10.5 percent more than in 1941.

The additional demand for salt has come principally from expansion in the chemical industry, water softening, meat packing, and food processing. The following table shows the quantities of evaporated and rock salt consumed by various class of industry as reported by the Bureau of Mines:

Tons of Rock and Evaporated Salt Consumed by Class of Industry in 1941

Industry	Dry Salt Consumed, 1941
Chemical 1/	1,792,628
Textile, hides and leather	357,371
Meat packing	831,258
Other food processing	482,539
Livestock	773,058
Table and household	495,821
Water softening	353,055
Other uses	863,463
Total	5,949,193

1/ About two-thirds of this quantity is used in the manufacture of chlorine, bleaches, chlorates, etc.

Further increases in consumption of salt are anticipated in 1943. Chemical industries will require more salt to manufacture chlorine to be used in high octane gasoline, munitions, parachutes and anti-freeze. Metallurgical uses of salt should also increase, with the steel and basic magnesium industries consuming larger quantities. One basic magnesium plant coming into production at Las Vegas, Nevada, is expected to require 200,000 tons of salt a year. Some increase in evaporated and rock salt for livestock feeding may also be expected. The other uses of salt will probably remain constant. Altogether, about a 5 to 10 percent increase in salt production may be expected in 1943. The Chemical Division, WPB, reports that the Salt Industry has informed them that they intend to produce 6,500,000 tons of dry salt during 1943, an increase of 7 percent. However, originated tonnage should be considerably higher because most of the new chemical plants will depend on rail shipments of dry salt. Consequently, a 15 percent increase in rail loadings has been estimated for 1943.

PHOSPHATE ROCK

Production of phosphate rock in 1942 is reported by the Bureau of Mines at 5,336,000 tons compared to 5,251,000 tons in 1941, an increase of 1.6 percent. At the same time rail tonnage of phosphate rock declined from 6,749,000 in 1941 to 6,309,000 tons in 1942, or a little more than 6 percent. It is believed that the decline in exports of phosphate rock may have accounted in part for this decrease, but still every ton exported has to be originated by rail and there should not be a very great difference here.

There is no very good relationship between the production figures of phosphate rock and the statistics of tons originated reported by the ICC. For every year examined, including the last five years, the ICC statistics of originated tonnage have exceeded production as reported by the Bureau of Mines. The chief problem area is Florida, where approximately 2 million more tons of phosphate rock are reported as originating in states where there is no production, but the discrepancy in the case of Florida is easily the greatest problem. The following table shows a comparison of originated tonnage and production for 1941.

Rail Shipments and Production of Phosphate Rock, in 1941
(Short Tons)

Area	Revenue Tons Originated (ICC)	Production 1/ (Bureau of Mines)
Florida	5,825,221	3,769,441
Tennessee and Virginia	659,319	1,254,801
Montana, Idaho, Utah	221,906	226,668
Other	42,579	0
Total	6,749,025	5,250,910

1/ Rock sold or used by producers

Analysis of the ODT one-day study reveals that two-thirds of the cars were reported as crude rock phosphate and one-third as ground phosphate.

Traffic representatives of the Atlantic Coast Line and Seaboard Airline have furnished information that nearly 90 percent of the rock in Florida is mined wet and that the wet rock is shipped to driers, except where drying equipment is located at the mine. The railraod representatives were of the opinion that most of the Florida rock is treated in this fashion. Generally the dried rock is ground by the drying company.

For some years shipments of phosphate rock reported by the Bureau of Mines have been less than mine production, and producers have considerable inventories of phosphate rock on hand. At the same time it is expected that larger quantities of superphosphates will be produced in 1943 than in 1942, and this accounts for three-fifths of the consumption of the rock. Shipments by rail are longer today since there has been diversion of the coastwise shipments from Florida to North Atlantic ports. But the carloadings of phosphate rock have shown no tendency to increase and it is believed that there will be a slight decline in 1943, a decline which is now estimated at 3 percent.

Production, Shipments & Rail Tonnage of Phosphate Rock, 1940 - 1943
(Short Tons)

	1940	1941	1942	Estimated 1943
Production	4,556,246	5,511,344	5,539,585	5,430,000
Percent change		+ 21.0	+ .5	- 2.0
Shipments	4,483,024	5,250,910	5,335,936	5,200,000
Percent change		+ 17.1	+ 1.6	- 2.6
Rail tonnage	5,916,143	6,749,025	6,308,852	6,120,000
Percent change		+ 14.1	- 6.3	- 3.0

SULPHUR

Production of sulphur came to 3,516,000 short tons, mined almost entirely in the Gulf States of Texas and Louisiana. However, shipments exceeded production and amounted to a total of 3,810,000 tons of which 3,454,000 tons were handled by Class I carriers. This does not, of course, mean an all-rail movement for this tonnage, since in 1941 around 1,006,000 tons were shipped by steamer, 561,276 by barge, and 34,999 by sea train. In 1942, production was about 10 percent higher, reaching 3,875,000 tons. Shipments, however, dropped off, particularly in the last quarter of the year, to an annual total of 3,508,000 short tons. This lag in shipments particularly affected the railroads, and originated tonnage dropped nearly 10 percent to 3,120,000 short tons.

The reason for the drop is fairly well known. In 1941, considerable stockpiles of sulphur were created in anticipation of the war, some of these being located at upper Mississippi River ports and at Chicago. For that reason shipments exceeded production at the mines. At the same time domestic consumption of sulphur has not increased at the rate expected. The Bureau of Mines places 1942 consumption at 2,770,000 short tons, only 6 percent above the 1941 figure. Chemicals, fertilizers, insecticides, pulp and paper and other uses, have not needed new sulphur in the quantities expected, largely because they have found regenerated sulfuric acid suitable for their purposes. At the same time consumers have drawn on their stocks instead of calling for shipments from the Gulf area.

For the first part of 1943 the trend in production has been definitely downward--January and February were 23 percent lower than the same months of 1942. Stocks at the mines are adequate for nearly two years' supply at the present rate of consumption, and present demands do not justify continuation of production at the former level. Shipments, however, have been only 4 percent lower than in 1942. At some point consumers will have drawn their stock down to the point of needing additional shipments from the producing area, but it is unlikely that there will be any great increase in demand in 1943. Pulp and paper, dyes, paint and varnish will be down; regenerated sulfuric acid will be more and more used in the manufacture of fertilizers; and it is unlikely that explosives and chemicals will take up the slack.

Shipments, therefore, should not be any greater than in 1942. At the same time more tonnage of sulphur may be shifted to barge movements up the Mississippi, depending on the number of barges converted to petroleum movements. Barges carried approximately 650,000 tons in 1942 as compared with 561,276 tons in 1941; this figure could be raised to 700,000 tons. Diversion from coastwise shipments has, of course, greatly increased the average length of haul by rail, but has not added to tonnage originated, since there was a prior or later rail movement for most of the tonnage shipped along the coast. Consideration of the foregoing factors warrants the conclusion that there will be no increase in rail movements in 1943, and quite possibly a decrease, but not exceeding 10 percent. In the summary table, an estimate of no change in revenue tons originated has been made.

Production, Shipments and Rail Tonnage of Sulphur, 1941-3
(Short Tons)

	1941	1942	Est. 1943
Production	3,516,000	3,875,000	3,100,000
Percent change		+ 10.2	- 20.0
Shipments	3,809,579	3,508,000	3,508,000
Percent change		- 7.9	+ 0.0
Rail tonnage	3,454,099	3,120,125	3,120,000
		- 9.7	+ 0.0

PRODUCTS OF MINES, NOS

This large class is composed chiefly of fluxing stone, glass and molding sand and various minerals and materials which go into construction, abrasives and many other uses. Limestone and dolomite used as fluxes, fertilizers and other industrial purposes, represent more than half of the tonnage of the class. Glass sand, molding sand, clay and kaolin account for another 29 percent of the class. Other important mine products listed in this class are gypsum, bituminous asphalt rock, slate, feldspar and fluorspar. Together with the limestone, sand and clay, these products account for 90 percent of the carloads reported on the one-day study. In 1942, the loadings of Class 392 aggregated 50,656,000 tons, an increase of 8.8 percent over 1941. This added tonnage may be ascribed to expanded operations in refractory and metallurgical use of limestone, molding sand and fire clay, and to expansion in the glass industry absorbing glass sand, and limestone. On the other hand, several materials used for construction declined substantially, principally gypsum, slate and common clay. An exception to the trend of construction materials listed in this class was bituminous asphalt rock; the mining of this rock increased nearly 50 per cent in 1942. (See Asphalt under Products of Mines).

In estimating changes in this category for 1943, the problem becomes essentially one in evaluating the increase in steel and glass production as against declines expected in materials used principally for construction. In the case of limestone it is assumed that there will be a 10 percent increase in the amount used for flux and agricultural liming materials for 1943, but that other uses will increase only 3 percent, since these include some uses of limestone for construction. The following table shows limestone production as reported by the Bureau of Mines, 1941, excluding limestone listed above under Crushed Stone and presents estimates for 1942 and 1943. 1942 figures have not been tabulated by the Bureau of Mines.

Production of Limestone Included in Class 392, 1941-3
(Short Tons)

	1941	Est. 1942	Est. 1943
Fluxing stone 1/	27,436,440	30,180,000	33,200,000
Agricultural Lime	11,909,640	13,500,000	14,800,000
Other 2/	12,303,830	13,780,000	14,200,000
Total	51,649,910	57,460,000	62,200,000

1/ Including dolomite and marble.

2/ Includes the following uses: Alkali works-5,888,260; Refractory-980,190; Limestons Sand-877,730; Filler-814,110; Sugar-624,450; Limestone Whiting-417,750; Glass-385,680; Calcium Carbide-468,600; Other-1,271,930.

It is estimated that the use of sand for glass works and foundries will continue to increase, probably by 10 percent in 1943. 1941 statistics are furnished by the Bureau of Mines, and 1942 and 1943 figures listed in the table below are estimated.

Production of Glass and Molding Sand, 1941-3

	1941	Est. 1942	Est. 1943
Glass Sand	3,475,111	3,892,000	4,281,000
Molding Sand	7,246,081	7,971,000	8,768,000
Total	10,721,192	11,863,000	13,049,000

The most important clay is furnace or fire clay, and this type of clay has been increasing at the rate of about 10 percent a year. On the other hand, common clay used for brick-making has been declining along with kaolin used for ceramics; bentonite clay used for foundries has also been increasing. The follwoing table shows 1941 reported figures of production of the various clays and estimates for 1942 and 1943.

Production of Clay, 1941-3

	1941	Est. 1942	Est. 1943
Fire Clay	4,167,567	4,584,324	5,042,756
Common Clay	1,201,168	1,089,151	762,406
Kaolin	1,172,989	1,000,000	700,000
Bentonite	354,028	389,431	428,374
Ball Clay	198,445	158,756	95,254
Total	7,094,197	7,121,662	7,228,790

Gypsum, another major item in Class 392, has been declining in production as war construction does not require as much plaster as residential building. It is hardly likely that very much of the production of gypsum gets on the rails. Judging by the proportion of cars carrying gypsum to the total cars in Class 392 in the one-day studies, there are only about 1,600,000 tons of gypsum carried by rail and three-fourths of this tonnage is crude gypsum. Total production of crude gypsum, however, is reported at about 5,036,000 tons for 1942 while calcined and other processed gypsum came to 4,600,000 tons. Thus, in the table below gypsum is over-weighted and tends to depress the 1942 figures.

The mining of bituminous rock is expected to decline slightly with construction. Production of crude barite also shows a decline in the first months of 1943 (barites was discussed under Ores and Concentrates, NOS). The trend in other mine products is indicated in each case in the table below.

Figures reported by the Bureau of Mines and various Industry Divisions of WPB are the basis for 1942 and 1943 estimates in the accompanying table. Many of the 1942 figures have been tabulated by the Bureau of Mines and others are in the process of being tabulated. It will be observed that a fairly close correlation exists between the trend of production and the trend of rail shipments between 1941 and 1942. The 1943 figures reveal that production of these minerals should be approximately 5.7 percent higher than in 1942, and it is therefore estimated that the rail tonnage will be increased by 6 percent.

Estimated Tonnage of Production and Imports

of Products of Mines, NOS

1941-1943

	% of Cars in One-Day Studies	1941 1/	Estimated 1942	Estimated 1943
Limestone & Dolomite	51.7	51,649,910	57,460,000	62,200,000
Sand	15.1	10,721,190	11,863,000	13,050,000
Clay & Kaolin	14.1	7,094,197	7,121,700	7,229,000
Bit. Asphalt Rock	2.3	654,690	935,000 2/	850,000
Fluorspar	1.0	230,300	220,800 2/	269,000
Ganister Rock	0.6	1,236,370	1,300,000	1,496,000
Barite (Crude)	0.6	503,160	432,000 2/	389,000
Gypsum (Crude)	3.2	6,054,085	5,035,851 2/	3,500,000
Feldspar (Ground Only)	1.1	354,417	327,786 2/	320,000
Fuller's Earth	0.4	208,000	200,000	215,000
Magnesite	0.6	224,000	265,000	316,000
Pyrites	0.3	659,488	500,000 3/	540,000
Talc	0.8	312,068	376,000	378,000
Slate	1.3	618,660	590,770 2/	450,000
Abrasives	0.8	546,056	750,000	1,075,000
Earth (Diatomaceous)	1.0	156,803	165,685 2/	170,000
Titanox	0.3	84,200	40,780	120,000
Graphite	0.2	51,024	58,629 2/	62,000
Mica (All grades)	0.2	44,448	34,045 2/	28,000
Other 4/	4.4	250,000	270,000	290,000
Total	100.0	81,653,066	87,947,046	92,947,000
Percent Change			+ 7.7	+ 5.7
Rail Tonnage		45,567,087	50,656,312	53,676,000
Percent Change			+ 8.8	+ 6.0

1/ All figures are reported by the Bureau of Mines.

2/ Reported by Bureau of Mines.

3/ Estimated by Chemical Division, WPB.

4/ Grinding pebbles, soapstone, alumina, and other minerals. Figures estimated.

V. PRODUCTS OF FORESTS

An unusually large tonnage of forest products moved by rail in 1942. Class I carriers reported 84,570,000 tons originated in 1942 as compared with 71,540,000 tons originated during the previous year, an increase of 18.2%. Construction and shipbuilding combined to create a heavy demand for lumber, with total requirements coming to more than 40 billion board feet. This compares with an estimated consumption of 36.7 billion board feet of 1941. The actual production of lumber in this country was not any higher than in 1942 but was actually about 10% lower, indicating that a great deal of the lumber moved out of stocks. This withdrawal from stocks is estimated at 5 billion board feet in 1942. The cutting of logs also shows a decline of about 10% in 1942. Domestic production and imports of pulpwood were close to 7% higher above the 1941 figure, rising from 15.7 million to 16.7 million cords. Some increase in the production of fuel wood, railroad ties, veneer wood, charcoal, chemical wood, sawdust, wood shavings, (the last four items are included in Class 443, Products of Forests, NOS), occurred; but these are much smaller in tonnage than the "big three" of forest products, logs, lumber and pulpwood. An increase in these small items will not explain the overall 18% increase in forest products.

The chief answer to the rise in the tonnage originated by Class I carriers may be traced to diversion from truck and water shipments to the railroads. For lumber and logs, this diversion was most noticeable in the South and the Pacific Northwest; for pulpwood, in the South and Great Lakes region. There was a general shortage of lumber trucks in the South and Pacific Northwest which resulted in the shifting of considerable tonnage from highway to rail movement. In the Pacific Coast region, another factor of prime importance was operative, that is, the practical cessation of lumber shipments to the East by way of the Panama Canal. It is estimated that approximately 1,235,000 short tons of lumber were diverted from the Panama Canal and approximately 660,000 tons diverted from movements along the Pacific Coast. As a consequence, rail loadings of lumber in Washington, Oregon and California rose sharply, accounting for approximately 50% of the increase in the rail tonnage figures of lumber originated during the first three quarters of 1942. As previously mentioned, another reason for the increase in rail shipments above production was the drawing down of inventories of lumber.

For 1943 all signs point to a considerable decline in the shipments of forest products with marked decreases in the major items of logs, lumber and pulpwood. Production in the woods began to drop off in the last quarter of 1942 and has shown no signs of revival. A shortage of manpower and severe weather resulted in a 14% drop in carloadings of forest products for the first quarter of 1943 below the first quarter of 1942. Very little of this decline may be attributed to heavier loadings of forest products, especially lumber. It is now estimated that total production of lumber will not be any higher than 29 billion board feet, a decline of 16% below 1942 output. Some additional diversion from trucks may be expected, particularly in the South, and some additional tonnage may be thrust upon the railroads if the tugs are requisitioned in the Puget Sound area; but these are small factors compared to the combined truck and water diversions which occurred in 1942. A survey conducted by the U. S. Forest Service indicates that the average haul and pattern of shipments will not be essentially changed in 1943. Both domestic production and imports of pulpwood will be substantially reduced. Therefore, it must be concluded that rail shipments of forest products will decrease from 10 to 20% in 1943. For the present, a 12% reduction in revenue tons originated is indicated.

LOGS

No very exact figures are available on the quantity or types of timber cut in the U. S. by years. The only method of obtaining an estimate of the annual production of logs in the U. S. is to apply a conversion factor to the tonnage of domestic lumber production. Applying such a factor, it may be calculated that the tonnage of logs cut in the U. S. in 1942 amounted to approximately 45.5 million tons. In 1941 it is estimated that approximately 47.4 million tons of logs were cut, indicating that 1942 production was down about 4%. However, the tonnage originated by Class I carriers was up a little over 10%, reflecting the diversion to the railroads from trucks and waterways. The shortage of off-the-highway trucks was most evident in the South, but in the Pacific Northwest the truck situation has been made more critical by the requisition of tug boats for military use and the menace accompanying coastwise movements of logs.

As previously mentioned, all indications point to a marked diversion in the number of tonnage of logs to be cut in 1943. The most aggravating factor is an acute shortage of manpower in the various producing areas in the country. Bad weather, equipment and transportation problems all affect the situation but manpower is the greatest headache.

Efforts are being made to increase the output of logs and lumber, particularly in the Yellow Pine area, but it is unlikely that the tonnage of lumber cut will be more than 90% of the 1942 figure. Some additional diversion from trucks may be anticipated, and possibly further loss of boats in the Puget Sound area--although strenuous efforts are being made to retain the boats in their present uses, but on the whole the decline in production will have a marked effect upon the rail figure. It is estimated that the latter will decline approximately 10% in 1943.

Production and Shipments of Logs by Class I Railroads, 1941-1943

(Short Tons)

	1941	1942	Estimated 1943
Domestic Lumber Production (Excluding Imports) 1/	47,388,000	45,540,000	40,986,000
Estimated Tonnage of Cut Logs 2/	102,129,000	98,146,000	88,330,000
% Change		- 3.9	- 10.0
Rail Loadings	16,827,051	18,545,050	16,690,000
% Change		+ 10.2	- 10.0

1/ Conversion factor supplied by U. S. Forest Service:
1 billion board feet=1,320 tons

2/ Weight of lumber estimated by U. S. Forest Service at .464 weight of logs.

POSTS, POLES AND PILING

The most important items revealed by the O.D.T.'s one-day study are poles and piling with fence posts and mine timbers amounting to less than one-fifth of the total number of carloads. There is no very good relationship between the rail classification and production of the items in this class as reported by the U. S. Forest Service. The following table indicates the percent of the 1942 tonnage carried by the railroads (3,298,000 tons) broken down into the various groups and 1942 production as reported by the Forest Service Division.

Comparison of Items of Class 401 with Production as Reported by the U. S. Forest Service

	Percent of Carloads	Est. Tonnage Shipped	Tonnage of Production
Posts	11.6	382,580	10,800,000
Poles	41.5	1,369,000	420,000
Piling	40.1	1,319,860	966,000
Mine Timbers	6.9	227,560	4,750,000
Total	100.0	3,298,000	16,936,000

It seems reasonable to conclude that very few fence posts go by rail and only a portion of the mine timbers; but it is obvious that the proportion of poles and piling does not correspond very accurately with production as reported by the Forest Service. Two things should be pointed out here: (1) figures on production of these items are hard to get and not too reliable; (2) it is sometimes difficult to distinguish poles and piling from logs, and these items may be classed as logs.

A comparison of traffic and production figures (see following table) reveals that a great deal of tonnage of posts, poles and piling was probably diverted from the railroads in 1942, possibly to trucks concentrating on local hauls. Most of these materials with the exception of cedar poles used for telephone poles and some mine timbers are hauled very short distances.

Because of the general shortage of lumber and a decline in construction, there should be substantial cuts in the items included in this class, particularly fence posts, poles and piling. Production of mine timbers will probably not be substantially below the 1942 level. In all the 16-25% cut in the classes indicated and the rail tonnage has been estimated at 80% of 1942.

Production and Rail Shipments of
Posts, Poles and Piling, 1941-3
(Short Tons)

	1941	1942	Estimated 1943
Production 1/			
Posts	9,450,000	10,800,000	8,640,000
Poles	385,000	420,000	266,000
Piling	289,000	966,000	580,000
Mine Timber	3,800,000	4,750,000	4,750,000
Total	13,924,000	16,936,000	14,236,000
% Change		+ 21.6	- 16.0
Rail Shipments	3,395,008	3,297,827	2,638,000
% Change		- 2.9	- 20.0

1/ Figures furnished by U. S. Forest Service.

FUEL WOOD

Since the railroads carry a very small percentage of the total production of fuel wood, the relationship between the cutting of wood for fuel and rail shipments is quite tenous. The United States Forest Service estimates that approximately 120 million tons of wood was produced for its use as fuel; of this tonnage the railroads carried a little over one million tons. Obviously the freight rate makes shipment of such wood by rail relatively expensive.

Total production of fuel wood is estimated to have risen 7% in 1942, and the railroad revenue loadings are reported slightly more than 6% higher than in 1941. In 1943 it is estimated that the cutting of wood for fuel will be much less, despite the fact that such wood is desired as a substitute for coal and oil. Manpower will be the limiting factor. There seems to be no reason to expect a diversion from trucks to rail for this type of movement, and is estimated that the rail loadings of fuel wood will be approximately 10% less in 1943.

TABLE 1

Production and Shipments of Fuel Wood, 1941-3

	1941	1942	Estimated 1943
Production (000 cords) 1/	70,000	75,000	67,500
Tonnage 2/	120,540,000	129,150,000	116,235,000
% Change		+ 7.1	- 10.0
Rail Tonnage	942,073	1,001,492	901,000
% Change		+ 6.3	- 10.0

1/ Estimated by U. S. Forest Service.
2/ Factor of 1,722 tons per 1,000 cords supplied by U. S. Forest Service.

RAILROAD TIES

Railroads received many more new ties in 1942 than they did in the previous year in line with the general increase of the railroad maintenance program. Normally from 40 to 50 million railroad ties are laid annually by the railroads, and in 1942 the number of ties was probably closer to 50 million. It is estimated that 2.7 billion board feet of lumber were used in the form of railroad ties, bridge and structural ties in 1942, compared to 2.2 billion board feet in 1941. This represents an increase of 22.4% and does not thoroughly explain the 46% increase in revenue tons originated shown by the Interstate Commerce Commission.

Analysis of the O.D.T. one-day study reveals a considerable number of car loadings of old railroad ties in transit, and the number of car loadings of such ties shows a large increase in September over the May figure. From nine to ten thousand miles of old rails and ties were salvaged in 1942 by the railroads and turned over to the Army, Lend-Lease, the Steel Industry and other users. In many cases the old ties went right along with the track; it is estimated that approximately 500,000 more tons of old ties were returned by the railroads in 1942 than in the previous year.

In 1943 this salvage program will be continued but not at the same high level. Perhaps 8,000 miles of line may be reclaimed for other uses. More significant however is the decline in the quantity of sawed cross ties allotted to the railroads. It is quite possible that the railroads will receive only three-fourths of the new ties they purchased in 1942, and they will hardly be able to supplement this supply with hewn ties since the production of such ties requires considerable manpower. Consequently it is estimated that the tonnage of ties to be carried as revenue freight by the railroads will be approximately 20% lower in 1943.

Estimated Shipments	1941	1942	Estimated 1943
New Ties (Million bd. ft.)			
Sawed 1/	1,423	1,823	1,400
Hewn	800	900	700
Total	2,223	2,723	2,100
Tonnage of Sawed Ties 2/	3,016,760	3,864,760	2,968,000
Tonnage of Old Ties	100,000	600,000	500,000
Total	3,116,760	4,464,760	3,468,000
% Change		+ 43.2	- 22.3
Rail Tonnage	2,371,691	3,458,667	2,767,000
% Change		+ 45.8	- 20.0

1/ Including bridge and structural ties.
2/ Hewn ties not included, since most of these would be non-revenue freight.

PULPWOOD

This class includes pulpwood and pulp logs, the latter term being used particularly of the West coast pulpwood timber. In 1941 approximately 15.7 million cords of pulpwood were consumed by U. S. Mills, of which roughly 1.6 million were imported from Canada. 1942 pulpwood production was stepped up about 7% with an especially large increase in the South and Great Lakes region. Total pulpwood production in 1942 came to 16.7 million cords, of which 2.3 million were imported from Canada.

Considerable diversion of pulpwood traffic to the railroads developed in 1942. Class I carriers reported 17,880,000 tons of pulpwood originated in 1942 as compared with 14,354,000 tons originated in the previous year. The large increase in the rail figures is a reflection of diversion of Newfoundland and Canadian imports from water to rail because of problems in coastwise shipping, the tight situation on the Great Lakes and a large shift from truck to rail. The loss of pulpwood traffic to trucks occurred principally in the South where the trucks were absorbed in construction work. Analysis of reports from Wisconsin, Minnesota, and Michigan reveal that more than 60% of the increase in pulpwood loadings by the railroads occurred in these states as a result of diversion of lake boats for hauling pulpwood. Sizable reductions in domestic production and in imports of pulpwood is in store in 1943 (the figures are 11.3 and 1.7 million cords respectively.

It is estimated that in 1943 the total available supply of pulpwood will be around 13 million cords. Some pessimists are forecasting a supply of only 12.5 million cords. Assuming that the supply will be close to 13 million cords--equivalent to a 22% loss in production--it is estimated that rail shipments will be off 16% in 1943. Since most of the shifts which can be made have already occurred, it is not likely that there will be very much diversion during the coming year.

Production and Shipments of Pulpwood, 1941-3

	1941	1942	1943
Production (Millions of cords)			
United States	14.1	14.4	11.3
Imports (Canada)	1.6	2.3	1.7
Total	15.7	16.7	13.0
Tonnage	31,400,000	33,400,000	26,000,000
% Change		+ 6.4	- 22.2
Rail Shipments	14,353,848	17,880,909	15,019,000
% Change		+ 24.6	- 16.0

LUMBER, SHINGLES & LATH

In 1942 there was a marked increase in consumption of lumber, and an even greater increase in rail shipments, despite a slight decline in domestic production. It has been pointed out previously that approximately 5 billion board feet were withdrawn from stocks, bringing many of these to an abnormally low level. Besides there was the tremendous diversion of shipments from coastwise movement and intercoastal movement through the Panama Canal to the railroads, estimated at 660,000 tons in the case of coastwise movements and 1,235,000 tons from the Panama Canal. If this diverted tonnage is subtracted from the total tons of lumber estimated to have been shipped by rail, revenue loadings will closely approximate estimated shipments as shown in the table below. Indications point to another year in which requirements for lumber will be greatly in excess of production. Requirements are now set at 33.5 billion board feet, while production is expected to fall as low as 30 billion board feet because of lack of men in the forests and the closing down of many small saw mills. In a recent survey of representative saw mills, the Lumber Manufacturers Association reported that about 60% of the mills were experiencing labor shortages, 30% reported production down because of bad weather conditions, while equipment problems, prices, and transportation had restricted production from one to eight percent of the cases. The same survey showed that these mills were operating at the following percents of their 1942 level of operations by areas of the U. S.

Production of Lumber in Sample Mills by Geographic Areas
Percent of 1942 Operations During First 16 Wks. 1943

	Percent
Southern Pine	82%
West Coast (Douglas Fir)	80%
Western Pine	90%
California Redwood	95%
Southern Cypress	90%
Northern Pine (No Hemlock)	60%
Northern Hardwood	67%
Southern Hardwood	88%
Total	88%

For the year the U. S. Forest Service estimated a decline of from 10 to 15% in production of lumber. The drop in shipments, however, should be much greater because it would be impossible to draw down inventories to the extent of last year's withdrawals. Many of these stocks are already low, and it is estimated that no more than 2 billion board feet can be withdrawn in 1943. Some further diversion from trucks is possible in the South and in the Pacific Northwest; but this should not be considerable and efforts are being made to increase the number of lumber trucks. At this time no further requisitioning of boats in the Puget Sound area is contemplated. Consequently a decline of approximately 15% seems to be indicated in rail shipments.

Tonnage of Lumber Produced and Shipped by Rail, 1941-3

(Billions of Board Feet)

	1941	1942	Estimated 1943
Production	35.9	34.5	31.0
Imports	1.4	1.5	1.0
Added to Stocks	0.6	--	--
Withdrawn from Stock	--	5.0	2.0
Estimated Shipments	36.7	41.0	34.0
Tons 1/	48,400,000	54,120,000	44,880,000
% Change		+ 11.8	- 17.1
Rail Shipments	26,022,781	32,523,812	27,645,000
% Change		+ 25.0	- 15.0

1/ Ratio used by U. S. Forest Service: 1 billion bd. ft. = 1,320 tons.

BOX, CRATE AND COOPERAGE MATERIALS

As with so many lumber products, no suitable figures on the output of materials used for containers exist, the only available statistics on production and requirements are probably many millions of board feet away from actual production. 1942 production is estimated at 136% and 1942 requirements at 162% of 1941. However, rail loadings increased only 6%, indicating that shipments were substantially below estimated production and requirements. On the other hand, it should be noted that the railroads carry only a small part of the total tonnage of production, probably about one-fifth, as indicated in the table below. Most of the mills making cooperage materials are located near forests, truck out the cut lumber, mill it to the shape desired, and ship out by truck to packers, brewers, and other users. Some packers, such as the California Fruit Growers Exchange, have their own saw mills for making boxes and crates for their fruit shipments.

Another significant factor is this: war plants crating airplane parts, tank parts, and a thousand other parts and finished products, purchase materials for packaging as lumber, not as box, crate or cooperage stock. Consequently rail shipments are probably not a very accurate reflection of the use of lumber for containers and packaging.

Any estimate of rail shipments for 1943 is largely guess-work While requirements call for an increase of 30% in materials for wood containers--part of the increase results from a shortage of steel drums--the general shortage of labor will affect the supply of lumber available for such containers. It may be impossible for manufacturers of wood containers to increase output at all. An increase in production need not necessarily result in an increase in rail shipments, because such a great part of the materials are trucked and because the materials may be purchased as lumber. In the absence of any more definite information the tonnage of box, crate and cooperage materials has been left at last year's level of 2,719,000 tons.

Requirements and Rail Shipments of

Boxes, Crates and Cooperage Materials, 1941-3

	1941	1942	1943
Requirements			
Boxes and Crates (Million Board Feet) 1/	5,501	8,840	11,527
Cooperage (Million Bd. Ft.)			
Slack	447.4	559.3 2/	588 3/
Tight	357	750	1,142.4
Tonnage of requirements			
Boxes and Crates	7,261,300	11,668,800	15,215,600
Cooperage	1,286,900	2,155,400	2,900,700
Total	8,548,200	13,824,200	18,116,300
% Change		+ 61.7	+ 31.0
Rail Tonnage	2,565,508	2,719,035	2,719,000
% Change		+ 6.0	+ 0.0

1/ Supply estimated as follows (millions of board feet): 1941 - 5,501; 1942 - 7,500; 1943 - 9,950.
2/ Excludes 9 million board feet of fiberboard barrels.
3/ Excludes 21 million board feet of fiberboard barrels.

VENEER AND BUILT-UP WOOD

Statistics are relatively meager in this class of forest products, particularly for years before 1942. Most of the output of veneer wood goes into plywood production which is most urgently required for airplane bodies, landing barges and other military equipment. Strenuous efforts have been made to increase the output of veneer logs, but such logs have to be of exceptionally good quality, free from knots and other defects, and consequently their output is limited to a considerable extent by the same factors affecting the supply of ordinary logs.

Production in 1942 is estimated at about 12% above the 1942 level, agreeing very closely with the figures of railroad tonnage reported. Just what the situation will be in 1943 is not clear, except insofar as it is known that present production of veneer and plywood is much below requirements. There has been a drop in the cutting of Douglas fir, the source of a great deal of plywood; since Douglas fir logging is about 20% under last year's level of operations, efforts will have to be made to increase output of veneer logs in the northern and southern hardwood regions, particularly the latter. At present it does not seem likely that the production of plywood will equal that of 1942; but because of the recognized need of increasing 1943 production and steps being taken to achieve this goal, and because of the location of new areas of production in relation to consumers, it is estimated that there will be a slight increase in the quantity of plywood moving by rail.

Production and Shipments of Veneer and Built-Up Wood, 1941-3

	1941	1942	1943
Production of veneer logs (000,000 board feet)	1,459	1,624	1,543
Total square feet (000,000) 1/	10,535	11,727	11,141
Softwood plywood		1,956	
Hardwood plywood		1,442	
Hardwood veneer		8,329	
Tonnage of production	2,604,000	2,900,000	2,755,000
% Change		+ 11.4	- 5.0
Rail Tonnage	964,151	1,073,577	1,127,000
% Change		+ 11.3	+ 5.0

1/ Similar figures for 1941 do not exist.

ROSIN

Two kinds of rosin exist, gum and wood. The first is obtained by distilling the sap of Southern Pine trees, the second, by wood distillation. Because of a slight increase in the output of wood rosin, total rosin production increased approximately 3% in 1942. This does not include imports from Mexico, which are less than 0.1 of 1% of the total supply.

However, rail shipments increased about 7% in 1942, largely as a result of the diversion of shipments from Gulf ports to an all-rail haul to northern consumers. While most of the rosin shipped out of Mobile and other ports had a prior rail haul, some apparently were trucked in and it is this tonnage which now must move entirely by railroad. About 80% of the rosin moves in drums in box cars and approximately 20% in tank cars.

In 1943 labor shortages will affect rosin production, particularly the output of gum rosin. The Chemical Branch expects a decrease of 15 to 20% in the output of gum rosin, but an increase of nearly 10% in distillation of wood rosin. This balances out to a 3% decrease in the total rosin production. Since further diversion is unlikely to occur, it is estimated that rail loadings will decrease by the same percentage.

Production and Rail Shipments of Rosin, 1941-3

	1941	1942	1943
Production (000 barrels)			
Gum	1,000	999	833
Wood	1,103	1,167	1,266
Total	2,103	2,166	2,099
Tonnage	525,750	541,500	524,750
% Change		+ 3.0	- 3.0
Rail Tonnage	406,025	438,299	425,000
% Change		+ 7.9	- 3.0

TURPENTINE

From the standpoint of tonnage involved, turpentine is a relatively minor product. Rail loadings amounted to only 82,500 tons in 1942, out of a total production of 98,000 tons (excluding the weight of containers). In 1942 tonnage of production decreased 13%, the railroad shipments a little less than 7%, indicating that there was some diversion from trucks in the haul of turpentine. As in the case of rosin, some coastwise shipments from southern ports were diverted to railroads in 1942. About 50% of turpentine moves in tank cars and the other 50% in containers in box cars. The situation in regard to production and shipments should not be very different in 1943; and as indicated below, it is expected that production will be off about 3%, and rail tonnage about 2%.

Production and Rail Shipments of Turpentine, 1941-3

	1941	1942	1943
Production (000 barrels)			
Gum	301	285	250
Wood	248	182	205
Total	536	467	455
Tonnage	112,560	98,070	95,550
% Change		-12.9	- 2.6
Rail Tonnage	88,370	82,544	81,000
% Change		- 6.6	- 1.9

CRUDE RUBBER

As might be expected, rail loadings of crude rubber fell sharply in 1942, from 971,000 tons in 1941 to 538,000 tons. Over the same period, imports declined from 1,029,000 to 284,000 long tons. In 1943 imports are estimated at only 44,000 long tons.

Rail tonnage did not drop as much as imports for the reason that there were many movements out of industrial and government stocks, and it is assumed that rail tonnage for 1943 will be more closely related to the figure of consumption than to any other. For that reason it is estimated that the loadings of crude rubber will be down by another 28% in 1943. The following table shows estimated imports: additions to and withdrawals from stock and consumption of crude rubber for 1941, 1942 and 1943.

(All Figures in Short Tons)

	1941	1942	Estimated 1943
Imports	1,152,000	318,000	49,000
Added to Stocks	278,000		
Withdrawn from Stock		148,000	287,000 1/
Consumption and Exports	874,000	466,000	336,000
% Change		- 46.7	- 27.9
Rail Tonnage	970,784	537,995	414,000
% Change		- 44.6	- 23.0

1/ Withdrawal of this quantity will leave the United States with approximately 100,000 tons of crude rubber at the end of 1943.

It should be noted these figures refer only to crude rubber. They do not include either general or special purpose synthetics, or reclaimed rubber, since it is estimated these items will be properly placed in Class 701, Manufactures and Miscellaneous, NOS.

FOREST PRODUCTS, NOS

The principal commodities included in this class, as indicated by the O.D.T. one-day studies, are acid and chemical wood, charcoal, cork, sawdust and wood shavings. Many of these products like charcoal, sawdust and shavings are by-products and relatively less profitable items. Others such as cork, gum and foreign lumber are highly valued and a considerable part of the supply has to be imported. It is estimated by the Chemical Division, W.P.B. that acid and chemical wood consumption will be about 10% greater in 1943 than in 1942 and that about the same tonnage of gum will be shipped in 1943 as in 1942. While requirements for charcoal and charcoal briquettes are higher, shipments in the Pennsylvania and New York areas are 40% below last year. The Cork and Asbestos Division, W.P.B. estimates that approximately the same tonnage of cork, cork waste and cork wood will be shipped in 1943, but predicts a 25% increase in shipments of compressed cork. The general increase for cork and cork products is 7%. The U. S. Forest Service expects the tonnage of sawdust and wood shavings to decline with the cutting of logs but estimates an increase in wood excelsior to meet added packaging requirements. More foreign lumber is expected to be brought into the country, particularly mohogany and balsa wood. Furniture stock, tanning and medicinal bark, and the various items lumped together as "Other" forest products (see table below) are expected to decline. The following breakdown indicates the relative importance of the various members in the class, the change expected and the weight which may be attached to them in 1943. The result indicates a 4% decrease in the class as a whole. This would lower the revenue tonnage figure to 2,890,000 tons in 1943.

Forest Products	1942 Weight	Percent Change	1943 Weight
Acid and Chemical Wood	21.3	+ 10.0	23.4
Bark, noibn	2.3	- 5.0	2.2
Charcoal Briquettes	2.4	- 30.0	1.7
Charcoal	10.6	- 30.0	7.4
Cork, Cork Waste, Compressed Cork	9.6	+ 7.0	10.3
Brewers' Chips	2.4	--	2.4
Excelsior	2.3	+ 10.0	2.5
Gum, noibn	2.6	--	2.6
Furniture Stock	1.8	- 20.0	1.4
Foreign Lumber	3.1	+ 25.0	3.9
Sawdust	14.2	- 10.0	12.8
Wood Fibre	2.4	--	2.4
Wood Flour	2.8	+ 10.0	3.1
Wood Shavings	12.8	- 10.0	11.5
Other 2/	9.4	- 10.0	8.5
	100.0		96.1

1/ Based upon percentage of carloads in O.D.T. one-day studies.

2/ Divy-divy pods, myrobalans, palmetto buds, pencil slats, pine tar, and other products.

V. MANUFACTURES AND MISCELLANEOUS

A 12 percent increase in the rail shipments of the miscellaneous semi-finished and finished products included in this group occurred in 1942. This increase may be ascribed to a general increase in production in 1942 (the index of industrial production was reported by the Department of Commerce at 180 in 1942 compared to 156 in 1941, an increase of 16 percent) and to substantial diversion from trucks and waterways to the railroads.

The selection of manufactured commodities included in this class is open to question. There is little reason for including cottonseed oil under Manufactures and Miscellaneous and cottonseed cake and meal under Products of Agriculture, since both are produced by the same process. Nor is there a very good reason why leather should be classed as an animal product and cotton, cloth, and textiles as manufactured products. Again, petroleum asphalt is termed a mine product while other end-products of crude oil refining are listed as manufactured products.

The basic industry whose level of operation determines the volume of output of many of these manufactured commodities is steel. Iron and steel products (Class 490-513, 583) account for nearly 78 million tons, or a little more than a fifth of the total of Manufactures and Miscellaneous. In addition, scrap iron and furnace slag, the quantities of which are correlated with iron and steel operations, represent 28.6 million tons, another 7.6 per cent. Then there are various finished products--machinery and boilers, automobiles, trucks, and agricultural implements--which depend on the iron and steel industry for a major part of their materials. Lastly, there is the very large miscellaneous group of items included under Manufactures and Miscellaneous, NOS whose tonnage aggregated 86.3 million tons in 1942, or 23 percent of Group V. Altogether, it may be estimated that the steel industry is involved in half of the tonnage of products included in Manufactures and Miscellaneous.

Other important product groups listed here are petroleum products with nearly 55 million tons in 1942 (14.5 percent of the total of Group V); cement and building materials, including fire brick, with 42 million tons (11.2 percent of the total); canned foods, sugar, syrup and beverages with 22 million tons (6 percent of the total); paper products with 12.3 million tons (3.3 percent) and chemicals, fertilizers, and explosives with 6.4 per cent.

While the production for sale of iron and steel products showed no increase in 1942 over 1941, shipments by rail increased markedly for the reasons presented within (See Iron and Steel Products). The rate of production of other industries--building materials involved in construction, fertilizer, canned foods and beverages, and especially chemicals and explosives--also increased visibly in 1942.

Diversion from water movement was particularly great in the case of finished iron and steel products and in canned foods. It is estimated that a million tons of iron and steel products and 700,000 canned food products were diverted from the Panama Canal in 1942. In addition, there was considerable diversion from trucks to rail of iron and steel products, building materials, textiles, and other manufactured products.

In 1943 the total rail loadings of the items classed in Group V were expected to increase by a little less than 5 percent as compared in 1942 over 1941. The reasons for the decline are as follows:

> While some increase in output of finished war materials moving in the iron and steel classes and in Class 701 is to be expected, part of this increase will be cancelled out in the decline of civilian goods. Again, most of the diversion expected to occur during the war has already developed and there should be very little more tonnage added to the railroad from trucks and waterways. Expected changes in production and shipment of the various manufactured products included in this group are explained in each case in the following pages.

REFINED PETROLEUM OILS AND GASOLINE

The main items included in this class are gasoline, kerosene, and distillate oils. In 1942 the tonnage this class carried by the railroads amounted to 30,443 thousand tons, a decline of 16 percent below 1941. The tonnage of refined products carried by the railroads is therefore the largest of any single class. The decline in gasoline resulted from limitations on gasoline consumption by passenger automobiles in 1942.

As was pointed out in the discussion of crude petroleum (under Products of Mines) it is preferable to discuss the crude oil and petroleum products as a group, since all are claimants of tank car capacity, with the exception of a few items such as kerosene which go in drums in box cars.

Only in the case of petroleum products did we have in 1942 an estimate of deliveries based upon the capacity of the various carriers. In 1943 also, supply and distribution will be limited by transportation facilities, and an estimate of the total amount of products to be delivered must be based upon the capacity of the individual transport agencies. In this traffic picture the most important element is the quantity of the various products which can be delivered into District 1. These deliveries of petroleum into District 1 have been estimated by the Petroleum Industry War Council and Petroleum Administration for War to be as follows:

Deliveries of Petroleum Into District I
(000 barrels)

	1943*	1942	Percent Change
Tank Cars	313,572	228,741	+ 37.1
Pipelines	141,178	43,815	+ 222.2
Barges	51,989	26,501	+ 96.2
Tankers	16,680	144,335	- 88.4
Total	523,419	443,392	+ 18.0

* Based on estimates of the Petroleum Industry War Council and Petroleum Administration for War.

While the flow of petroleum products into District 1 is the most significant part of the entire petroleum transportation picture--this service now employs 70,000 cars out of the estimated 110,000 petroleum tank cars--diversion of cars into the East Coast service tends to increase the length of haul faster than carloadings. While tank car deliveries for District I may go up, deliveries in the other petroleum areas will, of course, be diminished. In 1942 the average haul of petroleum products increased from 400 to 900 miles (250%) while total tonnage originated by rail increased from 69,324,000 in 1941 to 81,818,000 in 1942 (18 percent). Analysis of crude petroleum and asphalt which are included in the rail classification under Products of Mines, indicate that the loadings of crude petroleum may be expected to increase by 20 percent while asphalt loadings are expected to decrease by 15 percent. Another major group of petroleum products--gasoline and refined products--are not expected to show very much change in 1943. Requirements furnished by the Petroleum Administration for War are practically the same as in 1942.

Petroleum Product	(000 Barrels) Actual 1942	Requirements 1943
Refined products	622,302	629,990
Kerosene	72,243	71,500
Distillates	207,028	199,655
Total	901,573	901,145

For the first quarter of 1943 shipments of gasoline to the East Coast declined, since the emphasis was placed upon moving fuel oil and kerosene for heating. Deliveries of gasoline averaged 245,000 barrels a day compared to 273,000 in the last six months of 1942. Some pick-up in the loadings of gasoline and distillates and a decline in shipments of kerosene may be expected in the second quarter. The largest increase in loadings of refined products should occur in the third and fourth quarters, upon the completion of the 20-inch line to Norris City, Illinois. It is estimated that this line will be finished in September. Shipments of aviation gasoline will, of course, be much higher, but this will be offset by the decrease in gasoline for private automobiles. Tank trucks are expected to have a larger capacity in 1943 for handling local distribution of petroleum products, releasing tank cars from short haul service in the various petroleum districts. Altogether, it is expected that the tonnage of gasoline, kerosene and distillates to be carried by rail will be 95 percent of 1942 loadings. The complete picture for revenue tons of all petroleum products expected to be originated by the railroads in 1943, as compared with quantities loaded in 1942 and 1941, is presented in the following table:

Revenue Tons of Petroleum Products Originated by Class I Carriers, 1941 - 1943

	1941	1942	Est. 1943
Crude petroleum	7,317,674	21,179,792	25,416,000
Asphalt	6,652,273	5,860,945	4,982,000
Refined products	36,217,258	30,443,361	28,921,000
Fuel and residual oils	14,573,477	19,290,092	23,148,000
Lubricating oil	4,179,440	4,642,176	5,106,000
Petroleum products, NOS	383,560	401,771	402,000
Total	69,323,682	81,818,137	87,975,000
Percent Change		+ 18.0	+ 7.5

FUEL OIL AND OTHER RESIDUAL OILS

Residual fuel oil, primarily for industrial use, represents more than 90 percent of this classification. Road oil and other residual oils make up the remainder. In 1942 the tonnage of this class increased by nearly a third, due to the need of bringing in residual oils to the East Coast to make up for the decline in output of East Coast refineries. In 1943 a continued increase in railroad shipments of fuel oil may be foreseen. Requirements for residual fuel for the entire country are estimated at 421,210,000 barrels, compared to 417,000,000 barrels in 1942. It is estimated that conversion has reduced demand for fuel oil by approximately 43 million barrels and that this conversion may be carried to 60 million barrels. In the first quarter of 1943 the East was made to increase shipments of fuel oil to the East Coast, resulting in restrictions on the amount of asphalt and refined products shipped in tank cars. Some decline in loadings of fuel oil may be expected in the second quarter; upon the completion of the War Emergency Pipeline to the Philadelphia area, many tank cars will be put back into long haul service hauling fuel oil from Districts II and III. This should substantially increase fuel oil loadings in the last two quarters of the year. Requirements for road oil, estimated at 8½ million barrels in 1942 are expected to be about the same in 1943. All told, a 20 percent increase in fuel oil shipments is expected for 1943.

LUBRICATING OILS AND GREASE

An 11 percent increase in the tonnage of lubricating oil and grease carried by the railroads was registered in 1942, most of this increase coming in the last quarter of the year. It is estimated that in 1943 requirements for lubricating oil will be approximately 10.5 percent higher--41,245 thousand barrels compared with 37,329 thousand barrels in 1942. Most of the increase is for industrial requirements; consumption by private car operators should be less because there will be fewer cars in operation and fewer miles driven per car. It is, of course, true that the aging cars will demand more oil per mile operated; but an estimate of a 10 percent increase in total requirements for lubricating oil seems reasonable. Accordingly, rail shipments have been increased 10 percent.

PETROLEUM PRODUCTS, NOS

This small class is comprised chiefly of petrolatum, petroleum wax and jelly and other minor petroleum products. In 1942 the tonnage of these items increased by a little less than 5 percent. No change is expected in the tonnage of their loadings in 1943. It is assumed that butadiene will not be included in this class, but in Class 701, Manufactures and Miscellaneous, NOS.

COTTONSEED OIL

The crushing of cottonseed was carried on in 1942 at about the same level of operations as in 1941. However, shipments of cottonseed oil declined by approximately 9 percent, largely because withdrawals from stocks in 1942 were less than in the previous year. The quantity of cottonseed oil shipped by rail declined by a little more than 5 percent in 1942.

The manufacture of cottonseed oil depends largely upon the quantity of cottonseed available as well as upon the demand for the finished product. As was pointed out previously in the discussion of cottonseed, the seed is moved from gin to crusher by truck or by rail and is there crushed, with a little more than 15 percent of each pound of cottonseed becoming crude oil. The oil has a double movement; it moves first from the crusher to a refinery, since most mills do not do their own refining; and then moves from the refineries as a finished product. This is almost entirely a tank car movement.

In 1943, the cotton crop is estimated at a little less than in 1942. In the early months of the year there should be a good carry-over from the 1942 crop and the processing of cottonseed oil should be carried along at a particularly high level. In the last quarter of the year, the processing of cottonseed oil will be maintained at about the 1942 level. It is not likely that as much will be shipped out of stocks as in the past two years, although stocks are still at a reasonably good level. All the evidence points to a continuity of processing and shipments of cottonseed oil and no change has therefore been estimated in rail tonnage.

Production and Rail Tonnage of Cottonseed Oil, 1941-3
(Short Tons)

	1941	1942	Est. 1943
Production	695,790	693,085	675,000
Withdrawn from stocks	81,500	14,500	---
Total	777,290	707,585	675,000
Percent Change		- 9.0	- 4.6
Rail tonnage	916,951	870,442	870,000
Percent Change		- 5.1	---

LINSEED OIL

Production of linseed oil was stepped up in 1942 as a result of the increased demand for the oil for paints, linoleum, and other uses, and an ample supply of flaxseed for crushing. The increase in production of nearly 11 percent was matched by 12 percent increase in rail shipments.

The yield of linseed oil from the crushing of the seed is slightly higher than the yield of oil from the crushing of cottonseed. Oil accounts for a little more than one-third of the products produced by crushing flaxseed. Unlike cottonseed too, linseed oil does not have to be refined before shipment, but is shipped directly to paint factories, linoleum, soap and other manufacturers. Approximately half of the oil is shipped in tank cars and the other half in containers in closed cars.

1943 requirements, particularly for paint used in construction work, will be down; and there is some evidence that the crushers may not be able to keep up the present rate of operations. There is no shortage of seed for the crushers. At the present time the Department of Agriculture is estimating a 10 percent decline in the production of linseed oil. Consequently, a 9 percent decline in the rail shipment figure has been estimated.

Production and Rail Tonnage of Linseed Oil, 1941-3
(Short Tons)

	1941	1942	Est. 1943
Production	434,060	480,125	432,500
Percent Change		+ 10.6	- 9.9
Rail Tonnage	316,748	335,354	323,000
Percent Change		+ 12.3	- 9.0

VEGETABLE OILS, NOS

The principal oils included in this class are soybean oil, which represents about two-thirds of the total tonnage of oil produced; peanut oil coconut oil and palm oil. In 1942 the total production of these items declined by approximately 22 percent, largely because of a drop in the processing of peanuts, and a decline in imports of coconut oil and palm oil. Rail shipments declined by a similar percentage, as indicated in the table below. Emphasis is currently being placed upon the manufacture of these oils, particularly soybean oil and peanut oil, which are valuable substitutes for animal fats and oils. A particularly large increase is expected in the processing of soybeans. Approximately 120 million bushels of last year's crop and 25 million bushels of this year's crop are expected to be processed for soybean oil and cake. Estimates of the volume of peanuts to be crushed are constantly being reduced because producers are withholding the nuts until a higher price is granted and because a major part of the nuts are being bought up by cleaners and pickers. It is quite likely that major shipments of peanuts for processing will not come about until the latter quarter of the year. It is also in this quarter that soybeans are expected to be crushed in the greatest quantities.

The output of coconut oil is also being emphasized, largely because of its important uses in industry, in synthetic rubber, soap and glycerin production. Present shipping allocations will permit of enough imports of copra and of coconut oil to make available two-hundred million pounds of oil in this country, an increase of 38 percent over 1942. On the other hand, the output of palm oil, which is used largely for soap and other household purposes, is expected to show a continued decline in 1943.

In all, the output of these various vegetable oils is expected to be increased by approximately two-thirds in 1943. The largest increase will occur in the case of soybean oil, whose output is expected to be approximately 75 percent higher. Approximately 75 percent of the shipments of this class which travel by rail move in tank cars, the rest in containers in box cars and in refrigerator cars. As indicated in the table below, it is estimated that rail loadings of these vegetable oils will be 65 percent greater in 1943.

Production and Rail Shipments of Soybean, Peanut,
Cocoanut and Palm Oils, 1941-3
(Short Tons)

	1941	1942	Est. 1943
Production			
Soybean Oil	292,830	382,500	675,000
Peanut Oil	74,900	38,000	87,500
Cocoanut Oil	159,060	72,500	100,000
Palm Oil	154,070	38,000	23,500
Total	680,860	531,000	886,000
Percent Change		- 22.0	+ 66.8
Rail Tonnage	869,427	662,643	1,093,000
		- 23.8	+ 65.0

SUGAR

The rail shipments of sugar increased slightly in 1942 despite the fact that total production and imports of sugar declined by 26 percent. The reduction came largely in imports which declined from 5,644,000 tons in 1941 to 3,500,000 tons in 1942. Lack of shipping space was of course the factor responsible for reducing the tonnage of imported sugar.

The increase in rail shipments in the face of decreasing sugar production may be explained by two factors:

1. Consumption of sugar did not decrease to the extent of production (sugar consumed in 1942 is estimated at 6.6 million tons as compared with 7.5 million tons in 1941);

2. A considerable diversion of raw sugar from ocean shipment to rail movement occurred in 1942. Because of the threat to shipping, imports from Cuba were brought into Florida ports and then moved by rail to refineries in northern centers. Normally this raw sugar is shipped directly from the Caribbean to Baltimore, Philadelphia, New York and Boston. Imports from Peru continued to come in by steamer as usual.

In 1943 the production and imports of sugar are estimated at 5.4 million tons, a drop of 5 percent from the tonnage produced and imported in 1942. A considerable reduction in the domestic production of beet sugar is expected in view of the 30 percent decline indicated in the sugar beet crop. Domestic cane production should be about the same as in 1942, that is, roughly 470,000 tons. Because of the drop in beet sugar production, the import quota has had to be raised to the present level of 3,700,000 tons, the increase coming largely from Cuba and Puerto Rico. Consumption in 1943 is placed at 5.5 million tons, or 85 percent of 1942.

In estimating the rail movements it must be remembered that the first quarter of 1942 was unusually low because of the number of ship sinkings. It was not until the second quarter that the shuttle service from Cuba to Florida was inaugurated and the safety of imports guaranteed. It is, therefore, to be expected that the first quarter in 1943 will show a substantial increase over the same period of 1942, bringing the yearly total in 1943 slightly above last year's reported figure of revenue tonnage. Quarterly shipments should average slightly less than 1,400,000 tons and the total 1943 loadings are estimated at 5,500,000 tons.

Domestic Production, Imports and Rail Shipments of Sugar, 1941-3 1/
(000 tons)

	1941	1942	Est. 1943
Production			
Domestic cane	419,000	473,450	470,000
Domestic beet	1,588,000	1,677,350	1,200,000
Imports	5,644,000	3,499,999	3,700,000
Total	7,651,000	5,649,800	5,370,000
Percent Change		- 26.2	- 5.0
Rail Tonnage	5,180,900	5,372,916	5,500,000
		+ 3.7	+ 2.4

1/ Figures [illegible]

TABLE SYRUPS AND EDIBLE MOLASSES

The principal syrups included in this class are corn syrup, sorghum syrup and honey. Corn syrup is by far the largest of the group, accounting for 175 million out of a total of 231 million gallons produced in this country. Some edible syrup and honey are imported from the Carribean and Mexico.

In 1942, the production of the various syrups increased 46 per cent, due largely to a fifty percent increase in the refining of corn syrup. Imports declined slightly from 12 million gallons to approximately 10 million gallons. Including the movement of approximately 4 million gallons from stock, total shipments by all carriers are estimated at 1,400,000 tons, an increase of 44 percent over 1942. Rail shipments total 1,275,000 tons, an increase of 59 percent over 1941. Approximately 30 percent of the gallonage of the edible syrups moves in tank cars and 70 percent in containers in closed cars.

A reduction of from 5 to 10 percent in the domestic output of edible syrups is expected in 1943. The principal decline will occur in the case of corn syrup, production of which is now estimated at 160 million gallons. Other edible syrups will not change substantially; there will be increases in the cases of cane and sorghum syrups and inedible molasses, but a decrease of 3 million gallons in production of honey. Imports are now set at 5 million gallons, and it is estimated that about 2 million gallons will be withdrawn from stock. The aggregate picture is a 7.5 percent decline estimated in the volume of shipments. Upon this basis the rail tonnage figure has been set at 95 percent of 1942.

Total Shipments and Rail Loadings of Edible Syrups & Molasses, 1941-3

	1941	1942	Est. 1943
Shipments (000 gallons)			
Domestic production	158,200	230,710	219,200
Imports	12,190	9,829	5,000
Moved from stock	---	4,000	2,000
Total	170,390	244,539	226,200
Tonnage of shipments	979,816	1,406,205	1,300,750
Percent change		+ 43.5	- 7.5
Rail Loadings	801,339	1,275,593	1,212,000
Percent change		+ 59.2	- 5.0

BLACKSTRAP MOLASSES AND RESIDUAL BEET SYRUP

Shipments by rail of inedible syrups declined by 30 percent in 1942, largely because of a reduction of 40 percent in the volume of imports. Normally, imports account for nearly 90 percent of the total supply of blackstrap milasses and residual beet syrup. The reason why rail shipments did not decline as much as the estimated available supply of inedible syrups is that it is believed there were considerable withdrawals of inedible syrup and molasses from stock. However, no figures are available on this.

Inedible syrups produced domestically are by-products of cane sugar and beet sugar refining. Sometimes the sugar is refined several times in order to extract a maximum of edible products, since these are regarded as more valuable products. The residual, generally a dark and thick syrup, is mixed with other materials for animal feed and is made into alcohol, citric acid, acetic acid, and yeast.

It is estimated that the production of inedible syrups will be lower in 1943, since some decline in beet sugar production is certain. Imports from the Carribean area and from Hawaii are expected to be cut by nearly 70 percent. This would reduce the total supply of residual syrups by nearly 60 percent. Since additional movement out of stock in 1943 may be expected, it is estimated that total rail movement will be 50 percent of 1942. Because grain supplies were abundant, alcohol has been made from corn and wheat, rather than from residual syrups and molasses. In 1944, the situation may well be reversed and imports may be considerably higher.

Total Shipments and Rail Loadings of Inedible Syrups, 1941-3

	1941	1942	Est. 1943
Shipments (000 gallons)			
Domestic production	73,744	71,269	67,540
Imports	538,941	331,991	105,540
Total	612,685	403,260	173,080
Tonnage of shipments	3,600,000	2,369,330	1,016,920
Percent change		- 34.2	- 57.1
Rail loadings	1,205,294	849,790	425,000
Percent change		- 29.5	- 50.0

IRON AND STEEL PRODUCTS

The rail transportation of iron and steel products has increased considerably in the past two years. This was to be expected in view of the expansion in steel production which began in 1940, but the rise in rail shipments has been much greater than the increase in output of iron and steel items, particularly during 1942 when the tonnage of iron and steel products for sale actually declined. The following table shows iron and steel production measured by tons of pig iron and ingots, the volume of output of semi-finished and finished iron and steel products, and rail loadings of comparable classes of iron and steel products:

Production of Pig Iron & Original Ingots, Production for Sale of Iron & Steel Items & Loadings by Class I Carriers, 1940-43

	1940	1941	1942	Estimated 1943
Total Pig Iron Production 1/	47,398,529	56,686,604	59,069,000	64,830,000
% Change		+ 19.5	+ 4.2	+ 9.8
Total Ingot Production 1/	66,982,681	82,836,946	86,094,000	93,000,000
% Change		+ 23.6	+ 3.9	+ 8.0
Production for sale:				
Ingots, Blooms, Billets, Slabs 1/	5,725,868	6,925,892	7,608,554	7,800,000 2/
Finished Steel Products 1/	42,858,992	58,435,796	57,205,418	59,500,000 2/
Steel Castings 3/	985,600	1,578,000	2,339,000	3,200,000 3/
Pig Iron 1/	6,097,353	8,190,923	8,608,416	8,400,000 2/
Iron Products 4/	6,600,000	10,250,000	9,200,000	8,400,000 2/
Total	62,267,813	85,380,611	84,961,388	87,300,000
% Change		+ 37.1	- 0.5	+ 2.7
Rail Tonnage	52,403,563	72,336,780	77,696,108	79,030,000
% Change (Classes 490-513,583)		+ 38.0	+ 7.4	+ 1.7

1/ Reported by the American Iron & Steel Institute.
2/ Based on Controlled Materials Plan tabulations and monthly estimates of the Control Branch, W.P.B., for January and February, 1943.
3/ From the Steel Division, W.P.B.
4/ Covers 2,000 gray iron foundries out of an estimated 2900.

There are several factors which help explain the discrepancy between production and rail shipments of iron and steel products.

1. A large number of semi-finished steel products (ingots, blooms, billets and slabs) were reported in 1942. Exports of these commodities were more than twice as great as in 1941. Consequently, while movements of the semi-finished products by rail increase, production of finished steel products in this country naturally declined.

2. A significant decline in ingot yield occurred in 1942, a decline of approximately 2%. This reduced output of steel products finished from the original ingots was caused primarily by a shift from carbon to alloy steel and to products with low ingot yield, such as forgings and castings. Poor scheduling of operations in the transition period also accounted for lower production: one study reveals that lack of planning resulted in the loss of nearly 2,000,000 tons of steel plate in 1942.

3. A large part of the increase in the 1942 rail figures represents withdrawals from stock. It is estimated by the Steel Division that outbound shipments from warehouses in 1942 were approximately 5% greater than inbound shipments.

4. A large tonnage of iron and steel products was diverted to the rails from highway and waterway movements. The American Trucking Association estimates a 22% decline in the trucking of iron and steel products during 1942. Ordinarily 75% of the shipments from warehouses leave by truck. An even more important shift resulted from the closing of the Panama Canal to cargo carrying vessels. In 1941, 922,000 long tons of iron and steel products moved through the Canal; in 1942, only a little more than 27,000 tons. This represents a diversion of approximately 1,000,000 short tons from waterway movement.

The outlook for 1943 is for a small increase in the tonnage of iron and steel products for sale, and an even smaller increase (or possibly a decline) in the tonnage of rail shipments.

1. With a steel expansion program moving towards completion in the middle of the year, a better balance of the various factors of iron and steel products should exist. There should be fewer shipments of pig iron to non-integrated mills, and iron products generally are expected to fall by from 10 to 15%. Shipments of hot metal to increase ingot production will not be as necessary in 1943 as during the past year when ingot output was being stressed.

2. Ingot yield will be as low as or even lower in 1943 than in 1942. The output of alloy steel, castings and plates, which have a lower yield than sheet steel, will continue to be stressed.

3. Many of the finished products are tooled within the plants of the steel companies themselves and do not appear in the ordinary rail classes for iron and steel products (Classes 490-513,583), but are grouped in Class 701, Manufactures & Miscellaneous, NOS. These include such items as shell casings, gun mounts, tank parts, guns and other ordnance.

4. With the increase in war production and the great demand for iron and steel products, shipments are being made directly

from steel companies to points of final assembly without passing through the hands of warehousers. This tends to shortcut the warehouses and eliminates rebilling of shipments.

5. Because stocks of iron and steel products were pulled down severely in 1942, it is unlikely that movements out of stock can be as great as they were in the past year.

6. Division will probably not be as great a factor in 1943. Most of the shift from coastwise and intercoastal movements has already taken place, and it may actually be possible to ship more iron and steel products by inland waterways. Very little increase in diversion from trucks may be expected; since trucks are employed primarily for movements from warehouses to product users, the extent of this diversion is not likely to compensate for the decline in shipments to warehouses.

PIG IRON

Most pig iron is consumed by furnaces close by the point of pig output, and a large part of the amount that may be shipped between plants is carried by Class II or III railroads. Class I carriers normally handle about an eighth of the total pig iron production.

Inspection of the accompanying table reveals an interesting point: while total production for sale of pig iron increased by 5% in 1942, rail shipments of pig declined slightly. This may be accounted for by the following factors: (1) more of the pigs were consumed at home because of the scrap shortage (the percent of pig consumed in open-hearth furnaces to total consumption rose from 53% in 1941 to 54.7% in 1942); (2) movements of pig to merchants mills declined; (3) emphasis was placed upon ingot production in 1941 so that a great deal of pig moved as hot metal to increase the efficiency of ingot output.

In 1943 it is estimated that pig iron movements by Class I carriers will decline still further. There should be fewer shipments of hot mental and the drop in these shipments will more than offset any normal increase in pig iron production. Sales of merchant pig will be less than in 1942 -- the present estimate is 7,000,000 tons for 1943. A large movement of pig will occur on the West Coast, although some of the ton-miles of pig iron shipments in this area should be reduced by increased production from Fontana, California plant and the coming into production of the plant at Provo, Utha. Rail loadings of pig iron are expected to decline by 3.4% to a total of 7,250,000 tons in 1943.

Production, Sales and Rail Tonnage of Pig Iron

	1940	1941	1942	Est. 1943
Total Production	47,398,529	56,686,604	59,069,000	64,829,500
Percent Change		+ 19.5	+ 4.2	+ 9.8
Production for Salt	6,097,353	8,190,923	8,608,416	8,400,000
Percent Change		+ 34.3	+ 5.1	- 2.4
Rail Shipments	5,409,464	7,691,984	7,507,416	7,250,000
		+ 42.1	- 2.4	- 3.4

IRON AND STEEL, 6th CLASS

The chief items included as 6th Class are ingots, billets and slabs. As is the case with pig iron, only about an eighth of this class is normally handled by Class I railroads. The following table gives the figures on production and sales of 6th Class items reported by American Iron & Steel Institute, as well as rail shipments of 6th Class items:

Production, Sales and Shipments of Ingots

	1940	1941	1942	Est. 1943
Total Production	66,982,686	82,836,946	86,094,000	93,000,000
Percent Increase		+ 23.6	+ 3.9	+ 8.0
Production for Sale 1/	5,725,868	6,925,892	7,608,554	7,800,000
Percent Increase		+ 21.0	+ 9.9	+ 2.5
Rail Shipments 2/	7,967,214	10,572,542	12,193,889	12,560,000
		+ 32.7	+ 15.3	+ 3.0

1/ Includes exports and shipments to members of the industry.
2/ Difference between sales and shipments is represented largely by inter-plant transfers, with billets the largest single item.

It will be noted that rail shipments increased in 1942 by a much greater percentage than production for sale. This may be explained (1) by a much greater interplant transfer of ingots and billets for finishing within the steel industry and (2) the large increase in exports of semi-finished items. It is estimated that this class will continue to increase but by no means at the rate evidenced in 1942. A drop in export of the semi-finished products may be foreseen from recent agreements between the United States and other united nations. Consequently, more of these products will be finished in the steel plants themselves. Billets will continue to be shipped between plants for finishing into shell casings and into other ordnance items, and some increase in this type of movement may be anticipated. However, the rate of increases is expected to slow down in 1943 with the total for the year only 3 percent higher than the 1942 figure.

RAILS, FASTENINGS, FROGS, AND SWITCHES

In 1941, 1,130,000 tons of new rails were purchased by Class I carriers and deliveries were stepped up in 1942 to 1,260,000 tons of new rails. However, some additional rail was laid from stocks held over from previous years, bringing the amount laid by Class I roads in 1941 to 1,341,000 tons and in 1942, 1,355,000 tons. Normally track accessories, exclusive of frogs and switches, are estimated at approximately 60% of the rails laid, and frogs and switches are estimated at approximately 10% of the tonnage of new rails. In 1942, shipments of products included in this class increased by nearly one-fourth, an increase that is not supported to any great extent by figures of the tonnage of new rails and track accessories actually laid. This is largely to be explained by the increasing numbers of old rails which were taken up by the railroads to be delivered to steel mills for scrap or delivered to the Army, Lend-Lease, and other users. The Salvage Division, WPB, estimates that more than 90,000,000 linear feet of old rails were removed by the carriers in

1943 and a breakdown of this class on the one-day studies reveals a considerable number of old rails moving. These rails do not weigh as much as the replacements and are estimated by the Salvage Division to have an average weight of 75 pounds per yard.

Adding the tonnage of the old rails involved in 1941 and 1942 (recovery of old rails in 1941 is estimated at about 60,000,000 linear feet), the aggregate weight in 1942 is 22 percent higher than the previous year's total. This compares to a 23 percent increase in rail shipments in 1943.

It is estimated that the railroads will receive approximately 1,400,000 tons of new rails this year, 750,000 of these during the first six months. Movements of old rails will probably not be quite as large in 1943, since Army, Navy and other purchasers require only 50 percent of the 1942 tonnage of old rail. However, the remainder will go to scrap, and it is estimated that nearly 70,000,000 linear feet of old rails will be moved by Class I carriers. The total reveals very little change in the expected tonnage of rails and accessories to be handled by the carriers and accordingly no change in originated tonnage is expected.

Production & Shipments of Rails & Track Accessories, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
New Equipment:			
Rails	1,130,000	1,260,000	1,400,000
Fastenings	678,000	756,000	840,000
Frogs and switches	113,000	126,000	140,000
Old Rails	750,000	1,125,000	900,000
Total	2,671,000	3,267,000	3,280,000
Percent change		+ 22.3	+ .4
Rail shipments	2,365,852	2,913,216	2,913,000
Percent change		+ 23.2	+ 0.0

CAST-IRON PIPE AND FITTINGS, NOS

Inspection of the table below reveals a close relationship between production, shipments and tonnage originated by Class I carriers, of cast-iron pipe and fittings. The reasons why the tonnage of shipments reported by the railroads exceeds the other sets of figures are (1) the Cast-Iron Pressure Pipe Association does not include manufacturers of pipe fittings such as Walworth, Crane and others; (2) there is a small amount of reshipment of pipe and fittings by jobbers.

It will also be noted that while production and shipments of members of the Association increased 7 or 8 percent in 1942, rail loadings increased only 2 percent. This is probably to be explained by more direct shipments to consumers, instead of through jobbers.

At the present time the demand for cast-iron pipe is slackening off due largely to a slowing down of construction. Normally most cast-iron pipe is used by utilities for gas and water lines. Last year construction of defense plants, Army depots, Navy yards and docks, and other military installations absorbed most of the cast-iron pipe. Additions to lines of water companies have been steadily declining, and no further expansion of utility projects is in sight. Moreover, new military construction is on the wane; consequently it is likely that the demand for cast-iron pipe will drop very fast in the latter part of 1943. A conservative estimate is for a 10 percent drop in production and shipments. Because of the recent trend in rail originations of pipe, the elimination of jobbers, the rail tonnage figure has been decreased by 15 percent.

Production, Shipments & Rail Tonnage of Cast-Iron Pipe and Fittings, 1941 - 1943

(Short Tons)

	1940	1941	1942	Estimated 1943
Production 1/	790,039	1,092,252	1,188,980	1,070,000
Percent change		+ 38.2	+ 8.8	- 10.0
Shipments 1/	781,753	1,105,893	1,191,127	1,072,000
Percent change		+ 41.4	+ 7.7	- 10.0
Rail Tonnage	969,688	1,322,370	1,348,370	1,146,000
Percent change		+ 36.4	+ 2.0	- 15.0

1/ Statistics for 1940, 1941, and 1942 furnished by the Cast-Iron Pressure Pipe Association.

IRON AND STEEL PIPE AND FITTINGS, NOS

The correspondence in the trend of shipments of iron and steel pipe with production of the items included in this class is very close as indicated in the accompanying table. Analysis of the one-day studies reveals that pipe, principally steel pipe, represents more than 90 percent of all production billing in this class; conduits, tubing, pipe connection and supports comprise the remainder. There is also a relatively small tonnage of wrought iron pipe included here. The reasons why the figures of rail loadings given below exceeds reported production for sale are:

1. All steel pipe and fittings producers are not members of the American Iron and Steel Institute. This is particularly true of manufacturers of valves and fittings.

2. Ordinarily more than two-thirds of the billings go to jobbers who in turn ship to consumers, part of the shipments from jobbers going by rail.

After a very great increase in production of iron and steel pipe in 1941, due largely to accelerated construction and expanded oil field operations, production fell off by 10 percent in 1942. This may be accounted for largely by a decline in oil field drilling operations, a decline which increased construction and shipbuilding failed to offset. Shipments declined a little more than production for sale because less of the pipe in 1942 went to jobbers to be shipped.

In 1943, further reduction in the output of wrought iron and of steel pipe is in prospect. The use of new pipe by the oil, gas and mining industry is continuing to fall, and there are signs that the use of pipe for new construction and in the machinery and tool industries has reached the saturation point. Products of steel pipe and tubing held up fairly well in the first quarter of the year, part of the demand coming from the new pipe lines, a steady decline in production and billing of these items may be expected later in the year. At the present time an estimate of a 10 percent reduction in rail shipments seems to be justified, but shipments may actually drop far below this, for the tendency is progressively to eliminate shipments to middlemen. Therefore, a 15 percent decline in tonnage of pipe and fittings originated by the railways has been estimated.

Production for Sale and Rail Shipments of Iron and Steel Pipe and Fittings, 1941 - 1943

(Short tons)

	1940	1941	1942	Estimated 1943
Production for Sale 1/				
Steel pipe and tubing				
Welded	1,805,756	2,980,030	2,491,686	
Seamless	1,759,567	2,183,348	2,008,123	
Conduit	82,042	161,328	117,133	
Mechanical tubing	313,877	350,172	463,305	
Wrought iron pipe	43,926	71,152	96,989	
Total	4,005,168	5,746,030	5,177,236	4,918,000
Percent change		+ 43.5	- 9.9	- 5.0
Rail shipments	4,222,874	6,045,834	5,326,712	4,793,000
Percent change		+ 43.2	- 11.9	- 10.0

1/ From the American Iron and Steel Institute (Form 10).

IRON AND STEEL: NAILS AND WIRE, NOT WOVEN

After a 40 percent increase in production of nails and wire in 1941, production of these items decreased 6 percent in 1942. The ICC figures of rail tonnage originated follow a similar pattern, although the decrease in originated tonnage in 1942 was not as great as the decrease in production for sale. A check of monthly billings to consumers of wire and nails reveals that shipments to consumers were approximately the same in both years, with the latter half of 1942 slightly higher in the last 6 months of 1941.

It is apparent that 1941 was the best year for wire and nails as it was for iron and steel pipe and fittings. In this year civilian consumption of such items as bedsprings, racks of all sorts, and welded mesh items was particularly high. The demand for wire for new construction was also quite high. In 1942 construction absorbed additional nails, and larger cotton and hay crops called for more bail ties, but the demand for drawn wire for civilian goods items such as bedsprings was considerably reduced by limitation orders. Nor was the slack taken up by demands of the military for barbed wire.

The outlook in 1943 is for a continued decline in the output of items included in this class. No resumption of products of civilian goods items consuming drawn wire is in sight. A reduction in construction will curtail requirements for nails and staples. Since crops of flax seed, cotton and hay are expected to be smaller in 1943, fewer bail ties will be ordered by shippers. It is unlikely that the demand for barbed wire will increase by a substantial quantity, certainly not enough to offset other reductions. Consequently, a 15 percent decrease in production and in shipment of nails and wire is anticipated.

Production and Rail Shipments of Nails and Wire, 1940 - 1943

	1940	1941	1942	Estimated 1943
Production: 1/				
Drawn wire	1,552,912	2,307,623	1,981,203	
Nails & staples	641,453	782,234	845,249	
Barbed & twisted wire	213,825	279,780	301,416	
Bail ties	67,610	81,554	106,408	
Other	5,302	39,118	51,600	
Total	2,481,102	3,490,309	3,285,876	2,793,000
Percent change		+ 40.6	-5.9	- 15.0
Rail shipments	1,687,797	2,363,816	2,357,974	2,004,000
Percent change		+ 40.5	- 0.3	- 15.0

1/ Reported by the American Iron & Steel Institute (Form 10).

IRON AND STEEL, 5th Class

The chief items included here are steel bars, sheets, plates, forgings and castings. The tonnage of iron products included here is relatively slight, accounting for less than 10 percent of the carloads reported. Other iron and steel products many of them finished in the same shops but not included here are pipe, rails, car wheels and axles, nails and wire. The following table indicates production for sale and rail loadings of these items in 1940, 1941 and 1942.

Production for Sale & Rail Loadings of 5th Class Products, 1940 - 2

	1940	1941	1942
Steel Products 1/			
Sheets	10,346,111	12,855,283	8,613,767
Plates	4,194,932	6,027,001	11,543,171
Skelp	845,313	994,989	736,314
Black plate	338,655	474,433	419,176
Tin plate	2,689,856	3,565,885	2,657,950
Heavy structural shapes	3,149,036	4,586,652	4,937,795
Bars, cold & hot rolled	8,171,757	11,775,168	12,285,185
Tool steel bars	74,176	153,953	210,300
Wire rods	1,238,344	1,495,945	1,137,007
Strip	2,320,223	3,335,502	2,408,945
Piling	215,234	365,999	252,205
Castings 2/	985,600	1,578,000	2,339,000
Iron Products 3/	2,290,000	2,930,000	2,840,000
Total	36,859,237	50,138,810	50,380,815
Percent change		+ 36.0	+ .5
Rail tonnage	30,285,779	41,440,836	45,502,801
Percent change		+ 36.8	+ 9.8

1/ Reported by the American Iron and Steel Institute (Form 10)
2/ Figures furnished by Steel Division, WPB.
3/ Based upon reports of U. S. Bureau of the Census.

It will be noted that the war program has placed particular emphasis upon plates, castings and heavy structural shapes and forgings, needed for war equipment and less emphasis upon sheets used primarily in automobile production. This has resulted in a general lowering of ingot yield and has figures in the failure of the total output of 5th class items to match the increase in the production of ingots. Lack of balance and poor scheduling of the steel program also lessened output of finished items.

Another salient feature of the above table is the fact that rail shipments of 5th class products increased nearly 10 percent in 1942, while total production remained practically constant. This may be attributed to factors mentioned above, namely diversion of approximately a million tons from the Panama Canal, the fact that shipments from warehouses exceeded receipts by an estimated 5 percent, and diversion from trucks. Many warehouse inventories were pulled down very low by the middle of 1942 and thereafter outbound and inbound shipments were at approximately the same level.

No large increase in shipments of 5th class products is in sight for 1943. While production for sale of steel products, exclusive of castings, will undoubtedly be greater in 1943, the tonnage of iron products will tend to decline with decreased shipments of pig to non-integrated producers. For the first quarter of 1943, production for sale of steel products was reported by the American Iron and Steel Institute at only 2.4 percent above the first quarter of 1942. The tempo of production will be continually increased with new capacity coming into use and with better scheduling of operations, but it is unlikely that the total for the year will exceed 1942 by more than 6 percent.

Such an increase (6 percent) would not necessarily mean any increase in rail shipments. In the first place, these commodities are moving directly to war industries without first moving into warehouses and being reshipped. Secondly, such withdrawals from stock as occurred in 1942 cannot be repeated in view of the present low inventories in warehouses. Lastly, an increasing percentage of the output of steel products is being tooled within the steel plants themselves and the steel, instead of being shipped out as a 5th class product, goes out as an ordnance item in Class 701, Manufactures and Miscellaneous, NOS. Consequently, it is felt that a 6 percent increase in rail shipments of 5th class products would be optimistic. It seems more likely that very little increase, and possibly even a decrease, may take place in 1943. For conservative reasons a 5 percent increase has been assumed in rail loadings.

Production & Rail Shipments of Iron & Steel Products, 5th Class, 1940-3

(Short tons)

	1940	1941	1942	Estimated 1943
Production for Sale				
Steel products	33,583,637 1/	45,630,810 1/	45,201,815 1/	48,000,000 2/
Steel castings 3/	985,600	1,578,000	2,339,000	3,200,000
Iron products 4/	2,290,000	2,930,000	2,840,000	2,200,000
Total	36,859,237	50,138,810	50,380,815	53,400,000
Percent change		+ 36.0	+ .5	+ 6.0
Rail tonnage	30,285,779	41,441,836	45,502,801	47,780,000
Percent change		+ 36.8	+ 9.8	+ 5.0

1/ American Iron and Steel Institute (Form 10).
2/ Estimated from Controlled Materials Plan figures reported by the Steel Division, WPB.
3/ Figures furnished by Steel Division, WPB.
4/ Based upon reports of U. S. Bureau of Census for 1940-2 and upon CMP estimates for 1943.

COPPER: INGOT, MATTE AND PIG

Total production of metallic copper increased 11.5 percent in 1942 and rail shipments 12.2 percent. Increased output was obtained not only by refining domestic ores and concentrates but large quantities were imported as metal or refined from foreign ores, concentrates and blister. Also processed was a sizable quantity of African blister which came in under bond, and was reexported in a refined state to the United Kingdom. Not included in this class are scrap receipts of brass mills and other industries.

No increase in the supply of refined copper is expected in 1943, though every effort is being made to expand production. As pointed out in discussing "Copper Ore and Concentrates" (see Products of Mines), a labor shortage exists in the mines and production is not increasing at the rate hoped for. Although imports of bullion should exceed the 1942 figure, refining of blister for the United Kingdom will decline, leaving the total picture unchanged so far as total transportation requirements are concerned.

Production, Imports and Rail Shipments of Metallic Copper, 1941 - 1943 1/

(Short tons)

	1941	1942	Estimated 1943
Production of refined copper:			
From domestic ores, concentrates and scrap	1,015,900	1,140,600	1,186,500
From foreign ores and concentrates 2/	359,000	395,000	324,000
Imports of copper as refined metal	346,994	385,038	412,000
Total shipments	1,721,894	1,920,638	1,922,500
Percent change		+ 11.5	-
Rail shipments	1,295,487	1,453,743	1,454,000
Percent change		+ 12.2	-

1/ Statistics furnished by Copper Division, WPB.
2/ Including copper milled in bond.

COPPER: BRASS AND BRONZE

Statistics on the output of brass mills are not very reliable before 1942, but an estimate for 1941 indicates that deliveries of brass mill products in that year were 80 percent of 1942. This compares roughly with the 25 percent increase shown in the figures of tonnage originated by Class I carriers.

The Copper Division, WPB, expects shipments of brass mill items to be approximately 13 percent greater in 1943. Requirements, particularly for military cartridges, bullet jackets and shell casings and for naval propellers, valves and pumps have increased tremendously and are expected to absorb two-thirds of the total supply. It seems reasonable to assume that rail shipments will follow production changes closely, and the tonnage figure for 1943 has been placed at 115 percent of 1942.

Shipments and Rail Tonnage of Brass Mill Products, 1941 -1943 1/

(Short tons)

	1941	1942	Estimated 1943
Metal weight of deliveries of brass mill products	1,900,000	2,314,465	2,623,200
Percent change		+ 21.7	+ 13.3
Rail tonnage	711,467	891,950	1,026,000
Percent change		+ 25.3	+ 15.0

1/ Statistics furnished by Copper Division, WPB.

LEAD AND ZINC: INGOT, PIG OR BAR

The following table shows a total production of metallic lead and zinc in the United States, including imports and recovery of scrap, 1941 - 1943; amount of these metals stocked but not shipped; and rail tonnage of refined lead and zinc.

Lead and Zinc

	1941		1942		Estimated 1943	
	Lead	Zinc	Lead	Zinc	Lead	Zinc
Production:						
From domestic ores & concentrates	485.4	822.0	490.7	853	490	997
From foreign ores	108.5	-	109.2	-	75	-
Secondary	380.3	70.7	310.0	84	275	50
Imports	274.4	34.6	370.0	36	220	40
Recovery from scrap	-	128.1	-	143	-	195
	1,248.6	1,055.4	1,279.9	1,116	1,060	1,282
Amount stocked (not requiring railhaul)	-	5.0	142.0	30	-	-
	1,248.6	1,050.4	1,137.9	1,086	1,060	1,282
Total shipments (lead and zinc)	2,299		2,223.9		2,342	
Percent change			- 3.3		+5.3	
Rail transportation	1,820		1,791		1,898	
Percent change			- 1.6		+6.0	

From the above it may be seen that shipments of lead and zinc in 1942 did not show the increase revealed in the production figures. This was brought about by the stocking of refined lead imported from Mexico at Laredo and Brownsville, Texas, and at Selby, California. Zinc was stored primarily at the smelters. When the additions to stocks are subtracted from production shipments are estimated at 3.3 percent lower level, comparing very closely with the estimated 1.6 percent reduction in rail tonnage.

It is estimated that in 1943 supply and requirements of the two metals will very closely balance, with no large additions or withdrawals from stock. Therefore, it is estimated that rail tonnage will advance by the same measure as production, that is from 5 to 6 percent.

ALUMINUM: INGOT, PIG OR SLAB

Very great increases in the supply of aluminum occurred in 1942 to meet requirements of airplane production. From the accompanying table it is apparent that aluminum output nearly doubled in 1942, and that the 1943 supply will be three times that of 1941. Tonnage originated by the railroads did not increase as much as production, partly because of the accumulation of industrial stocks. Figures of the tonnage of aluminum in stock are not very accurate but show an increase of 50,000 to 75,000 tons. In 1943 an 80 percent increase in rail loadings of aluminum is indicated, though movements out of stock may result in still greater shipments

Aluminum

(000's of lbs.)

	1941	1942	Estimated 1943
Production:			
Primary	618,311	1,042,212	1,856,035
Secondary	188,363	356,724	586,500
Imports	25,268	255,140	484,400
	831,942	1,654,076	2,926,935
Tonnage	415,971	827,038	1,463,468
Percent change		+ 98.3	+ 77.0
Rail tonnage	194,051	347,433	625,000
Percent change		+ 78.9	+ 80.0

MACHINERY AND BOILERS

The exact composition of this heterogeneous class is hard to determine. Waybills reported in the ODT one-day studies, the only available sources of information, do not provide a satisfactory breakdown of the various types of machinery and parts shipped in this class. Inspection of the waybills suggests that boilers and boiler parts represent only a tenth of total shipments (at least for the period of 1942 covered by the studies), while the remainder is made up of machinery and parts, some of which are specified and some unspecified. A little more than 45 percent of the carloads were reported as Machinery and Parts, Not Otherwise Indicated by Name. It is believed that this percentage consisted largely of carloads of new parts and replacement parts excluding truck, automobile, tank and plane parts, and excluding also parts for agricultural machinery. All of these last mentioned parts are billed in other railway classes. Approximately 11 percent of the carloads were classed as engines, among which figured steam, gas, airplane and traction engines. The remaining cars carried construction, mining, textile, electrical, refrigerating and other machinery. A small percent of miscellaneous items, such as air compressors, air washers and mechanical stokers were also listed.

While a considerable growth of production and shipments of items included in this class took place in 1942, it appears unlikely that this performance can be repeated in 1943. The period beginning with the middle of 1941 and ending in the latter part of 1942 covered the tooling up of American industry which required expansion of facilities and installations of new machinery. The WPB has indicated that this phase of activity has ended and that no more new factories will be built. A considerable reduction in construction and mining machinery may be expected in 1943. On the other hand, many engines and many parts will be produced from the machines installed in the last two years, and a general increase in machinery and parts may be expected. However, some of this increase, at least that represented by airplane and tank parts, is included in Class 701. Automotive vehicles and parts and agricultural machinery and parts are included in Classes 580-582 and Classes 590-592. However, there will be marked increases in production of the following items which are classed as Machinery and Boilers: airplane engines, marine boilers and parts; Diesel engines and parts for tanks, ships and locomotives; pumps and pumping equipment for naval vessels; and replacement parts for all types of machinery.

On the basis of the breakdown afforded by the ODT one-day studies, and on the basis of information supplied by the Machinery and Tools Division, The Power Division and the Automotive Division of WPB, the following table has been constructed to represent the change in production of machinery and boilers. The result would appear to indicate a 9 to 10 percent increase in the volume of production of machinery and parts, and a 10 percent increase has been applied to the rail tonnage figure.

Estimated Changes in Production of Machinery and Boilers

	1942 Weight 1/	Percent Change	1943 Weight
Machinery			
Construction	6.6	- 25	5.2
Electrical	5.6	+ 5	5.9
Mining	3.7	- 25	2.8
Refrigerating	2.6	-	2.6
Textile	1.8	- 5	1.7
Other 2/	8.8	- 20	7.0
Boilers			
Steam	1.2)	+ 20	13.4
Other	3.0)		
Parts	7.0)		
Engines			
Steam	.7	+ 10	.8
Gas	1.1	-	1.1
Airplane	1.0	+100	2.0
Traction and Other	7.9	+ 10	8.7
Miscellaneous			
Air compressors & washers	2.6	-	2.6
Mechanical stokers	.7	-	.7
Machinery & parts, noibn 3/	45.7	-	54.8
Total	100.0		109.3

1/ Based upon ODT one-day studies.
2/ Largely for civilian industries including baking and laundry machinery, printing presses, elevators, and so forth.
3/ Believed to consist chiefly of parts.

CEMENT

The following table shows production and shipments of cement as reported for 1941 and 1942 and as estimated for 1943. Rail tonnage figures are also included for comparative purposes.

Cement

	1941	1942	Estimated 1943
Production (bbls.)	164,030,559	182,652,000	132,000,000
Percent change		+ 11.4	- 27.7
Shipments (bbls.)	167,439,237	185,167,000	129,600,000
Percent change		+ 10.6	- 30.0
Tonnage of shipments	31,600,000	34,940,000	24,450,000
Rail tonnage	24,417,563	28,058,744	19,640,000
Percent change		+ 14.9	- 30.0
Percent rail to total shipments	77.3	80.1	80.1

As is well known, the construction program in 1942 called for a large volume of cement production, and shipments in that year as well as in 1941 exceeded production. Rail tonnage increased somewhat more than shipments, and this may be largely explained by diversion from truck, and perhaps by diversion from the Great Lakes, though no reliable statistics are available upon either of these shifts.

With most of the important construction projects already completed -- the Army calculates that only 10 percent of its building programs remain to be finished this year -- it is estimated that cement requirements will fall by from 30 to 35 percent. The Statistics Division, WPB, figures dollar value of 1942 construction at $13,250,000,000, and the 1943 projects at $7,500,000,000. It has also been estimated by the Statistics Division that cement requirements would fall from 196,000,000 barrels to 137,000,000 barrels, a decline of 30 percent. Actual production is estimated to be 132 million barrels, a decline of 27.7 percent from the 182,652,000 barrels produced in 1942.

Portland cement shipments for March, reported to the Bureau of Mines, totaled 10,108,000 barrels, a decrease of 20 percent from March, 1942. However, decreases in cement production were small, so that stocks of finished cement at mills increased 1,284,000 barrels over stocks at the end of February to a total of 24,269,000 barrels on March 31.

For the first quarter of 1943, cement production was 5 percent below that of the corresponding 1942 period, and March was the second successive month in which production of finished Portland cement was lower than in the similar month of 1942. The March decline was more than double the corresponding 5 percent decrease recorded in February.

No further diversion to the railroads is expected, and it is quite likely that in view of a reduced demand for cement and better planning of construction, reduction in rail shipments may be even greater. It is estimated that shipments for the entire year will be 30 percent below shipments in 1942.

Present scheduling of construction calls for the completion of 60 percent of the 1943 projects by the middle of the year, and from that time on the drop in the building program will be quite sharp. The following table shows cement requirements by quarters for 1942 and 1943.

Requirements for Cement by Quarters

(000's of bbls.)

	1942	1943
First quarter	35,890	37,600
Second quarter	46,208	42,300
Third quarter	51,965	30,200
Fourth quarter	48,489	21,900
Year	182,652	132,000

COMMON BRICK

No recent figures exist on the production of the various kinds of brick and tile products by kind and quantity. The last report on the situation was made in the annual census of clay products made by the Bureau of the Census in 1941. This indicated that there were approximately 5,000,000 tons of common and unglazed brick used for building produced in the United States in that year. The Bureau of Mines, however, reported shipments of only 1,200,000 tons of miscellaneous clays which went to producers of building materials. It is readily admitted by the Bureau of Mines that their figures include only part of the industry.

"Bureau of Mines figures for clay shipments cover only a small fraction of the clay mined in the United States. No attempt is made to include the clay burned into common brick, building tile, sewer pipe, and other clay products at integrated plants situated at the mines or pits. On the assumption that it takes 3 tons of clay to make 1,000 brick, the production of common brick alone required over 22,000,000 tons of raw clay in the peak year 1925; notwithstanding diminished demand, structural clay products even now require from ten to fifteen million tons of raw clay a year. Only a little over half the total consumption of fire clay appears in the Bureau of Mines figures as shipments, because nearly half of the total (3,275,021 tons in 1941) is burned directly into refractories at pitside plants. About 4,000,000 tons of additional clay or shale are used in portland-cement manufacture, and most of this escapes inclusion in the annual clay statistics because it was neither sold nor shipped away from the mine. A rough calculation shows that shipments of what may be termed 'merchant' clay comprised in 1941 only 20 percent and in some years not more than 10 percent of the total clay or shale mined in the United States." (Minerals Yearbook on Clays, 1941, p.2)

Despite the small coverage of the Bureau of Mines figure, there is a fairly close relationship between the figure of shipments of miscellaneous clays reported by the Bureau, and the statistics reported by the ICC of revenue tons of common brick originated by Class I railways. Thus, shipments of common clay increased 17 percent in 1941 and declined 9.3 percent in 1942; revenue loadings of Class I carriers increased 18 percent for 1941 and declined 5.6 percent in 1942. The reason for the decline in shipments of common clay and brick in 1942 was the curtailment of nonessential public and private construction and the expansion in construction of military barracks, army depots, and the like, which use large quantities of sheathing, building board and other prefabricated materials in the place of brick, tile, lumber, and the like. In view of the anticipated 35 percent decline of construction in 1943, and continued substitution of other building materials for brick, it seems reasonable to assume that shipments of common clay and common brick will be 30 percent lower in 1942.

Shipments of Common Clay & Rail Tonnage of Common Brick, 1941 - 1943

	1941	1942	Estimated 1943
Shipments of common clay	1,201,168 1/	1,089,151 1/	762,406
Percent change		- 9.3	-30.0
Rail shipments of common brick	1,927,939	1,820,409	1,277,000
Percent change		- 5.6	- 30.0

1/ Reported by the Bureau of Mines.

OTHER BRICK AND BUILDING TILE

The chief item included in this class is fire brick with an estimated 70 percent of the total tonnage of bricks and tile. Nearly a fourth of the class is composed of hollow clay tile and other block and tile used for building purposes. The remainder includes unglazed brick, which together with common brick came to more than 4,100,000 tons in 1940. Probably large quantities both of fire brick and unglazed brick are shipped in this class than the one-day studies show.

In 1941 the Bureau of Mines reported 4,167,567 tons of fire clay shipped by producers and 3,275,021 tons burned directly into refractions at pitside plants. (See discussion of common brick above.) Fire clay shipments in 1942 rose 16 percent to a total of 4,839,332 tons and other fireclay amounted to 3,457,638 tons. It may be estimated then that roughly 8,296,970 tons of fire brick were produced in 1942, compared to 7,442,588 tons in 1941, an 11 percent increase (there is some loss of weight in burning of clay to brick, but not a great deal). Shipments out of stock of course may have been greater.

In the case of hollow clay tile and unglazed brick, data are available from the Bureau of Census and since August 1942 from the Building Materials Division of WPB. These show a slight decline in tonnage of hollow tile from 1,148,000 tons in 1941 to 1,054,000 tons in 1942. Unglazed brick output fell by more than 30 percent, from 5,077,000 tons in 1941 to 3,515,000 tons in 1942. However, face brick represents only part of this total, but face bricks have been dropping off faster than common brick in volume of shipments. It is estimated that face brick shipments represent one-sixth of total shipments and that their sales declined 35 percent in 1942. Applying these percentages in the case of face brick and the more reliable figures of hollow clay tile and fireclay, it may be calculated that shipments of this class increased 4.5 percent in 1942. This corresponds closely with the increase of 5.3 percent reported by Class I carriers, indicating that the method used may not be entirely without justification.

Production & Rail Shipments of Brick & Building Tile, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production:			
Firebrick	7,467,000	8,297,000	8,297,000
Facebrick	890,000	580,000	350,000
Hollow clay tile	1,148,000	1,054,000	600,000
	9,505,000	9,931,000	9,247,000
Percent change		+ 4.5	- 6.9
Rail tonnage	6,327,261	6,670,497	6,270,000
Percent change		+ 5.3	- 6.0

In 1943 shipments of firebrick are not expected to increase because the increase of 11 percent registered in 1942 resulted from expansion of steel facilities, and this program is nearing an end. After a slight increase in the first months of 1943, firebrick production is now on a level with 1942. On the other hand, the use of building tile and face brick is expected by the Building Materials Division to drop at least by 40 percent. The result is a 7 percent general decline in the class.

ARTIFICIAL STONE, NOS

Analysis of the one-day studies indicates that this class consists largely of concrete building blocks and slabs, with some asphalt blocks and other artificial stone and blocks comprising the remainder. The car billings may be classed as follows:

Concrete blocks and slabs	70 percent
Other blocks and slabs (incl. asphalt, gypsum, etc.)	30 percent

Consumption of these fabricated items is divided between building construction and paving. Because these artificial blocks are light, easily laid, and, in the case of building blocks, well insulated, they have been sought after especially for defense housing and other types of wartime construction. They are not as substantial or durable as common brick, but fit the needs of wartime building projects. Consequently, rail shipments of artificial stone increased 15 percent in 1942, and in the last quarter of the year were 10 percent above the same period of 1942. It is likely that the output of these prefabricated items will hold up as well as any building materials; but in view of the general 30 - 40 percent decline in construction, some drop in production and shipments of artificial stone may be foreseen. Therefore, the tonnage of this class has been reduced only 15 percent, making the 1943 figure 278,000 tons.

COMMON LIME

Total sales of lime in 1942 (6,076,000 tons) nearly matched the record output of 6,079,400 tons in 1941, according to preliminary figures released by the Bureau of Mines. However, because of changes in the character of wartime demands, sales of quicklime increased 7 percent while sales of hydrated lime decreased 20 percent. Greater use of lime in chemical and metallurgical plants, particularly quicklime, was offset by a marked drop in the amount of quick and slaked lime employed in construction. War buildings do not require as much lime as residential construction. Agricultural lime sales were at 97 percent of 1942, while the use of refractory lime (dead-burned dolomite) increased 15 percent.

Lime Sold or Used by Producers, 1941 - 1942

(Short tons)

	1941	1942
Chemical and industrial	3,561,203	3,777,000
Building	1,065,599	700,000
Agricultural	382,727	370,000
Refractory	1,059,887	1,229,000
	6,079,415	6,076,000

Railroad shipments declined 3 percent in 1942, slightly more than production as given above, chiefly because refractory lime is burned from dolomite close by the furnaces and does not usually require a rail haul. When the figures of refractory lime are eliminated, total sales reveal a decline of 3.3 percent, corresponding more closely with the rail figures (of the table below).

In 1943 a continuation of the trends visible in 1942 may be expected. A substantial drop in building lime will follow from the general drop in construction and limitations on private building. Agricultural use of lime should also taper off, with more substitution of crushed limestone. Substitution of agstone for fluxing and acid neutralizer may also tend to reduce chemical and metallurgical use, but some added consumption by these industries is likely. Approximately 100,000 to 150,000 tons of limestone will replace lime in the purification of bauxite. Altogether a 4.5 percent decline in sales of agricultural, building and industrial lime may be expected, accompanied by a similar decline in rail shipments.

Production and Rail Shipments of Lime, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production:			
Chemical and industrial	3,561,103	3,777,000	3,900,000
Building	1,065,599	700,000	420,000
Agricultural	382,727	370,000	360,000
Total	5,009,429	4,847,000	4,680,000
Percent change		- 3.3	- 4.5
Rail Shipments	3,277,995	3,179,938	3,053,000
Percent change		- 3.0	- 5.0

PLASTER

A 40 percent decline in the production of building plasters occurred in 1942. At the same time Class I carriers handled 32 percent less tonnage in Class 561, Plaster (stucco or wall) and Dry Kalsomine. The reasons for the decline in the use of plaster are inherent in the swing from private to war construction. These may be listed as (1) the ban on nonessential public and private construction by the War Production Board in April 1942; (2) the wide use of prefabricated materials in wartime building in order to conserve labor and time; (3) prohibitions against the use of lumber in construction were suitable substitutes are available.

Consequently, while sales of gypsumboard, sheathing, paperboard and wallboard have attained record proportions, a marked drop in demand for lath, stucco, kalsomine and other building plasters has developed. On the other hand, there has been increased use of surgical plaster for dental and orthopedic work. Agricultural and other gypsum is included in Class 392, Products of Mines, NOS. Gypsumboard is in Class 701, Manufactures and Miscellaneous, NOS.

Further decreased use of plaster is in store for 1943, according to reports received from the Building Materials Division and the Bureau of Mines. Sales of building plasters -- especially of the important "base-coat" and "gauging and molding" plasters -- were reported by the Bureau of Mines to have slumped to 40 to 50 percent of 1941 in the last quarter of 1942. The Building Materials Division places 1943 production at an estimated 760,000 tons, or 65 percent of 1942. Consequently a 35 percent decline in the rail tonnage figure has been estimated.

Production and Rail Shipments of Plaster, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production of plaster	1,941,000	1,174,000	760,000
Percent change		- 39.5	-35.2
Rail tonnage	1,307,532	893,742	580,000
Percent change		- 31.7	-35.1

SEWER PIPE AND DRAIN TILE

This class includes chiefly clay and concrete sewer pipe, also other clay and concrete products including conduits, culverts, drain tile, and drain pipe. More than two-thirds of the tonnage of the entire class is represented by clay sewer pipe; clay and concrete pipe together, representing a little over 80 percent of the entire class. Information on sewer pipe and kindred products is very inadequate. The Building Materials Division estimates that shipments of pipe and kindred products in 1942 totaled about 1,900,000 tons, of which pipe represented two-thirds of the total. Although data on shipments of these products in 1941 is lacking, it seems likely that there was some increase in their use in 1942. A great deal of sewer pipe and drain tile is known to have been employed in construction of new military camps, depots and defense plants.

It is estimated that in 1943 consumption of sewer pipe will probably not exceed one million tons, and the Building Materials Division believes that the figure may be much lower. Since the construction program in general is slated to decline from 30 to 50 percent, a reasonable guess would be that shipments of sewer pipe, drain tile and related items would decline by 35 percent. This would make the weight of these items to be originated by Class I carriers in 1943, 722,000 tons.

Shipments & Rail Tonnage of Sewer Pipe & Drain Tile, 1941-3

(Short tons)

	1941	1942	Estimated 1943
Shipments:			
Sewer pipe, drain tile & related items	1,700,000	1,900,000	1,235,000
Percent change		+ 11.8	- 35.0
Rail tonnage	983,603	1,110,899	722,000
Percent change		+ 12.9	- 35.0

AGRICULTURAL IMPLEMENTS AND PARTS, NOS

This class includes all agricultural machinery and parts exclusive of tractors and tractor parts. The chief machinery items shipped in this class are harvesters, threshers and combines, binders, plows, corn shellers, and ensilage cutters. However, it should be pointed out that the ODT one-day studies do not afford a very clear picture of the products billed here, since a majority of the carloads are not specified. It may safely be stated that parts represent a constantly growing percentage of this class, amounting to an estimated 40 percent in 1943.

Shipments of agricultural implements and parts billed here fell off in the neighborhood of 30 percent in 1942, because of limitation orders affecting the manufacture of agricultural machinery and the conversion of manufacturing plants to war work. Though some increase in the manufacture of parts will be permitted in 1943, the output of new machinery will be further curtailed. As shown in the following table, parts production is set at 167 percent of 1940, while new machinery excluding tractors, is cut to 41.5 percent of 1940.

	1940	1943
Machines	$378,000,000	$148,000,000
Tractors	123,000,000	42,000,000
All other	255,000,000	106,000,000
Parts	$ 63,000,000	$105,200,000
Tractor	26,000,000	43,400,000
Other	37,000,000	61,800,000

About a fourth of the other agricultural machines are harvesters and combines: 1940-- $32,000,000 (43,400 units); 1941-- $16,000,000 (19,000 units). Adding together the dollar value of other machines and the parts supplied for them, the 1943 dollar value of machines and parts is

57.5 percent of the 1940 figure. It may reasonably be assumed then, that shipments of Agricultural Implements and Parts, NOS, will be 60 percent of 1940. In 1940 the carriers originated 712,704 tons in this class; a 40 percent reduction makes the tonnage estimate for 1943, 428,000 tons. Compared with the tonnage originated by the railroads in 1942, this marks a decrease of 33.2 percent.

HORSE-DRAWN VEHICLES AND PARTS, NOS

Rail shipments of horse-drawn vehicles increased 80 percent in 1942, despite the fact that production fell from 97,000 units in 1941 to 66,000 units in 1942. It is believed that the explanation for this discrepancy lies in the fact that producers stocked up on wagons and other vehicles in 1941, but that most of these were shipped out in 1942 when the demand for this equipment suddenly increased. The new demand came from farmers desiring farm vehicles which did not involve gas, rubber or a large number of replacement parts. Many farmers are also known to have ordered parts to rehabilitate old horse-drawn vehicles.

The production quota on this type of equipment is set at 42,000 units in 1943, a decline of nearly 40 percent below the 1942 allotment. Because additional parts may be shipped this year and stocks of manufacturers are not yet exhausted, the rail figure has been reduced only 25 percent.

TRACTORS AND PARTS, NOS

This class represents not only farm equipment but many tractors purchased by the U. S. Army for construction work and employed by the Army Engineers for operations in this country and abroad. The Army has been taking a larger part of the caterpillar or track-type tractors, leaving the lighter wheel-type tractors for farm use. The number of units of each type produced in the past three years and expected production in 1943 as follows:

	1940	1941	1942	1943
Track lane	27,245	29,849	45,000	37,538
Wheel type	222,000	308,000	181,000	70,000

Rail shipments have followed the general pattern of production, increasing from 591,000 tons in 1940, to 771,000 tons in 1941 and 908,000 tons in 1942. The steady rise has reflected not only production of vehicles, and the shift to the manufacture of heavier-type of equipment in 1942, but the growing volume of replacement parts manufactured for old vehicles. In the case of tractors going to the Army, sufficient replacement parts to last a year or more are purchased and shipped with the new vehicles.

Production of both track lane and wheel type tractors will decrease in 1943, as indicated in the table above, but the quota of replacement parts is considerably higher than 1942 levels. It is known that many farm units are not in operation now because of lack of parts, and a determined effort is being made to ship these replacements before major use of the vehicles in the summer and fall. However, it is the Army tractors and parts that make the difference. Although the allotment on farm tractors and parts is about 60 percent of 1940, total tractors and parts are expected to be 150 percent of 1940. In terms of rail shipments this would mean 886,000 tons, a decrease of 2.4 percent below 1942.

RAILWAY CARWHEELS, AXLES AND TRUCK

The tonnage of railway car wheels, axles and trucks is dependent upon two factors: (1) the car building program, and (2) the railroad maintenance program. A number of items move to export, and some locomotive wheels and trucks are involved here, but two factors — the wheels and axles — account for seven-eighths of the entire rail category. The car-building program for 1941 and 1942, and the estimated number of cars to be completed in 1943, are as follows:

Railroad Car Construction Program

	1941	1942	1943
Domestic railroads	80,502 1/	63,009 2/	26,000 3/
Foreign railroads	2,386	-	-
Industrial cars	2,000	1,500	1,800
Army	-	10,000	40,000
Navy	-	1,000	300
	84,888	75,509	68,100

1/ Includes 2,200 privately owned cars.
2/ Includes 431 privately owned cars.
3/ Includes 6,000 cars remaining from 1942 program.

In 1941 the Chilled Iron Car Wheel Builders Association reported 2,293,000 wheels produced (equal roughly to 860,000 tons), while the American Iron and Steel Institute reported production of steel wheels at 268,165 tons and output of steel axles at 201,553 tons. While no figures on 1942 production of iron carwheels are available, the American Iron and Steel Institute reports that production for sale of steel wheels fall to 227,608 tons and steel axles to 181,840 tons. However, because iron wheels have been substituted for steel wheels, especially in maintenance, there is no reason to believe that the number of iron carwheels declined in 1942. On the contrary, an estimate of wheels needed for new construction and maintenance indicates an increased weight of 896,000 tons in 1942. About one-fourth of the iron wheels are used in new construction and three-fourths in maintenance, while steel wheels and axles go largely into maintenance. The Transportation Equipment Division estimates that a steel axle will outlast six or seven pairs of wheels, and the one-day studies indicate 12 tons of wheels moving for each ton of axles.

As indicated above the construction of new cars has been declining since the outbreak of war because of the critical materials involved. In fact, the decline in new construction is greater than the totals indicate because Army cars are estimated at only .65 percent of the weight of ordinary railroad cars. Maintenance operations will probably increase in 1943, but because of the large number of cars rebuilt in 1941 and 1942, there should not be much upward trend in the weight of wheels and axles used for such work. The overall picture indicates a 6 percent decline in tonnage of wheels and axles and this would place rail shipments in 1943 at 513,000 tons.

Production & Rail Shipments of Railway Carwheels & Axles

(Short tons)

	1941	1942	1943
Production			
Iron car wheels	859,875	896,250	891,375
Steel car wheels	268,165	227,608	182,000
Steel axles	201,553	181,840	150,060
	1,329,593	1,305,698	1,223,435
Percent change		- 1.8	- 6.3
Rail shipments	562,546	546,023	513,000
Percent change		- 2.9	- 6.0

AUTOMOBILES (Passenger)

Because of the conversion of automobile assembly lines to war production, there was a tremendous drop in the production and shipments of new passenger cars in 1942. The year 1941 was a banner year in the automotive industry, with 3,700,000 new passenger cars produced. In 1942 only 216,000 cars came off the assembly lines, a little less than 6 percent of the 1941 output. Rail shipments declined from 3,234,000 tons to 330,000 tons, or 85 percent. The only reason why the 1942 rail figure was not lower is that some new cars were shipped out of stock during the year.

No new cars will be produced in 1943, though schedules call for several thousand new ambulances. Some cars will move out of stock and be shipped around the country. However, it is not expected that the weight of all these shipments will exceed 160,000 tons for the year.

AUTOTRUCKS

In contrast with production and shipments of passenger cars, the output and movements of trucks and truck trailers increased markedly in 1942. Not only were more trucks produced -- an estimated 1,300,000 units in 1942 compared with 1,100,000 in 1941, but many movements of impedimenta by rail involved loadings of Army trucks. Altogether rail loadings of trucks increased by 133 percent over 1941.

Most of the new truck production went of course to the Army, though a large part of the stockpile of light, medium and heavy trucks was drawn on in 1942 for essential civilian users. The Army also withdrew 3,000 heavy trucks from civilian stocks. Continued withdrawals from the stockpile brought the number of heavy trucks to dangerously low levels in the early part of 1942, and authorization has been granted for the construction of 7,500 new heavy trucks for civilians in the third quarter of 1943. As many more may be constructed in the last quarter of 1943. Army units are expected to approximate 1,100,000. These units include light, medium and heavy trucks, tractors, semi-trailers, trailers and motorcycles. However, these do not represent requirements for this rail class, since tractors are included in Class 582 and motorcycles in Class 701. Moreover, it is the weight of the units that matters, since heavy trucks average 10 tons, compared to 3 tons for a light truck.

Since production will not be an accurate basis for estimating shipments in 1943 — because of withdrawals from stocks and movements of impedimenta -- the trend in quarterly shipments may be an index of things to come. These quarterly figures for 1941 and 1942 are as follows:

	1941	1942	Percent Increase
First quarter	162,287	371,321	128.8
Second quarter	161,215	437,609	171.4
Third quarter	231,899	515,066	122.1
Fourth quarter	253,650	564,098	122.4
	809,051	1,888,094	133.3

Information on the number and types of new units to be produced and released from stock in 1943 inclines one to believe that the tonnage of new trucks, trailers and semi-trailers shipped in 1943 will not be very much above the 1942 figure. It will be impedimenta movements which make the difference, and it is known that these will increase considerably. It may be estimated that there will be an increase of about 50,000 tons a quarter for these movements, making the total for 1943 2,750,000 tons, or 45 percent higher than 1942.

AUTOMOBILES AND AUTOTRUCKS, KNOCKED DOWN AND PARTS

This class includes not only replacement parts for civilian and military automobiles and trucks, but a much larger volume of knocked down parts moving for final assembly at plants scattered all over the country. The exact tonnages of the various items is not known, nor is there anywhere any breakdown of the major classes of products along the lines of the railway classification; hence, devious methods must be employed to arrive at an estimate of shipments.

In 1942 it is estimated that the value of replacement parts manufactured aggregated slightly more than $1,000,000,000, divided between civilian, military and export as indicated below. Actually from 14 to 25 percent of the civilian parts were purchased by the Army from dealers. In the same year the Automotive Council for War Production reported the total value of all vehicles produced at $3,300,000,000, of which $2,340,000,000 worth was shipped for final assembly. As was to be expected, a sharp decline in the value of automobile and truck parts shipped for final assembly took place in 1942, although the total value of items produced, including tanks and combat vehicles, increased substantially during the year. Parts for tanks and other military vehicles, however, are billed in Class 701, Manufactures and Miscellaneous, NOS, and are not involved here.

Altogether the shipments of parts for replacement and assembly declined by more than a third in 1942, the chief drop occurring in the case of auto and truck parts shipped for final assembly. Rail loadings slumped by a similar margin.

The situation is expected to be reversed in 1943. Impetus is being given to the manufacture of replacement parts, not only for military vehicles which consume enormous quantities of replacement parts, but also to civilian parts to maintain trucks, buses and necessary passenger vehicles.

Since there will be little change in the numbers of new trucks and cars manufactured in 1943, no change in the volume of parts shipped for final assembly has been made (70 percent of production is estimated produced at assembly centers). The final figure of the converted tonnage of all parts indicates a 12 percent increase in 1943.

Value & Weight of Replacement Parts & Parts Shipped for Final Assembly, 1941-1943

(000 Dollars)

	1941	1942	1943
Replacement Parts			
Civilian	$ 718,000	$ 510,150	$ 600,000
Military	300,000	400,000	740,000
Export	30,000	50,000	40,000
Total	1,048,000	960,150	1,380,000
Parts Shipped for Final Assembly	$2,340,000	$1,300,000	$1,300,000

(In Short Tons)

Replacement parts 1/	1,080,000	990,000	1,420,000
Assembly parts 2/	4,680,000	2,600,000	2,600,000
Total	5,760,000	3,590,000	4,020,000
Percent change		- 37.7	+ 12.0
Rail tonnage	5,732,959	3,579,910	4,000,000
Percent change		- 37.6	+ 12.0

1/ At 2.06 lbs. per dollar of value.
2/ At 4 lbs. per dollar of value.
3/ Does not include weight of containers.

AUTOMOBILE AND AUTOTRUCK TIRES

Nearly 50 million passenger car and 12,000,000 truck tires were produced in 1941. In 1942 the number of passenger car tires produced was negligible, but several million moved out of stocks in dealers hands. The output of truck tires increased slightly. In addition there was a sizable tonnage of old passenger tires obtained from civilians and added to government stocks in the last quarter of the year. Defense Supplies Corporation estimates that of a total of 11.5 million tires collected, approximately 8 million moved to central depots by the end of the year and about 2 million were distributed to other centers from the central depots. This leaves 3.5 million tires coming in during 1943 and about 4 million to go out to other centers (only one-half of these tires are found fit for re-use, the rest move as scrap).

New production in 1943 is estimated at 5 million passenger car tires and 13 million truck tires. Adding in the government tires moving to points of consumption, the total movement figures out about the same as in 1942. Accordingly the rail figures have been upped a trifle, from 495,000 tons in 1942 to 500,000 tons in 1943.

Estimated Shipments & Rail Tonnage of Truck & Passenger Tires, 1941 - 1943

	1941	1942	1943
New Production:			
Number of passenger tires	49,866,000	4,000,000	5,000,000
Number of truck tires	11,674,000	12,500,000	13,000,000
Requisitioned tires:			
Number moving		10,000,000	7,500,000
Shipments (tons):			
Passenger and truck	907,250	477,500	505,000
Old tires 1/	-	100,000	75,000
	907,250	577,500	575,000
Percent change		- 36.3	- .4
Rail tonnage:	711,496	495,369	500,000
Percent change		- 30.4	+ 1.0

1/ Passenger tires estimated at 20 pounds each and truck tires at 70 pounds.

METAL FURNITURE

A slight increase in shipments of metal furniture occurred in 1942 as a result of the accelerated construction program, the equipping of army camps and depots and government offices. The rise in metal furniture (5.8 percent) was far below the increase in shipments of other furniture, since the use of substitutes for metal furniture was stressed throughout the year. After the middle of the year a sharp drop in metal furniture shipments began so that the last quarter of 1942 was 37 percent below the last quarter of 1941.

	1941	1942	Percent Change
First quarter	93,243	114,377	+ 22.7
Second quarter	90,810	124,267	+ 36.8
Third quarter	91,862	95,363	+ 3.8
Fourth quarter	98,209	61,890	- 37.0
Total	374,124	395,897	5.8

The decline in the movement of metal furniture dates from the passage of Order M-126 limiting the amount of iron and steel consumption in metal furniture. The order prohibits the delivering, processing and assembling of any iron and steel for items included in List "A". This list covers such items as beds, bed spring frames, cabinets, desk equipment and others.

The downward trend will continue in 1943 and shipments are expected to drop rapidly as manufacturers' inventories become depleted. Another Order, L-260, limits the production of nonessential metal furniture parts. The Department of Commerce is of the opinion that the tonnage of metal furniture originated by rail in 1942 will not be above 140,000 tons, a decline of 64.6 percent.

OTHER THAN METAL FURNITURE

As pointed out above, shipments of wood furniture and of furniture other than metal increased 28 percent in 1942, reaching a total tonnage more than twice that of metal furniture. The expanded construction program and the use of substitutes for metal furniture gave impetus to the production and sales of wood furniture. The tonnage of shipments by rail gained steadily throughout 1942 and at the end of the year were 37 percent higher than at the end of 1941.

	1941	1942	Percent Change
First quarter	141,787	173,858	+ 22.6
Second quarter	156,519	210,226	+ 34.3
Third quarter	191,862	226,911	+ 18.3
Fourth quarter	183,160	251,059	+ 37.1
Total	673,328	862,054	28.0

All signs point to a decline in production of this kind of furniture, though the drop should not be as great as that predicted for metal furniture. The chief reason for anticipating a drop here is the difficulty of manufacturers in obtaining materials. As outlined in the discussion of Forest Products, the shortage of lumber has caused a downward revision of all allotments, especially where the end product is consumed primarily by civilians. Order L-135 restricts, as of November 1942, the manufacture of wood upholstered furniture. There is every indication that, with the drop in new construction, and the curtailment of the use of lumber, the output of wood furniture will be severely cut. After wood furniture the most important item in this class is mattresses, and fewer of these will be produced in 1943. Altogether it is estimated that there will be a 30 percent drop in shipments of other than metal furniture, placing the 1943 figure of tonnage originated at 600,000 tons.

BEVERAGES

The chief beverages in this class in order of importance are the malt beverages -- beer and ale -- distilled spirits and wine. These three groups of beverages account for more than 90 percent of carloads listed in Class 620 by the one-day studies. The remainder is made up of water, grape juice, cider and carbonated beverages (soft drinks). Beer alone represents a little more than 60 percent of the class.

In 1942 production and shipments of beverages were higher, and are estimated at about 112 percent of 1941. Rail shipments, however, were up more than 40 percent. This is believed to have resulted from a substantial diversion from truck, particularly evident in the last half of 1942. The figures indicate that trucks carried about two-thirds of beverages included in this class in 1941 and approximately 58 percent in 1942. A questionnaire sent out by the Beverages Division revealed that for shippers reporting, 77 percent of beer shipments went by truck and 23 percent by rail. The shift of only a few percentage points from the truck portion of total traffic would result in a substantial gain in the rail shipments figure. Another factor tending to increase this freight is the shift of beer from barrels to bottles. This raises the weight of the container relative to that of the bottled item; thus the same volume of beverage would weigh more than previously.

Some increase of shipments of distilled spirits and wine also occurred in 1942. Substantial stocks of spirits permitted a higher consumption despite the conversion of the plants in many cases to production of industrial alcohol. Shipments of soft drinks declined slightly in 1942, partly as a result of Order M-104 which limited the number of bottle caps which may be used.

Very little change is expected in production of beer in 1942 and shipments of distilled spirits and wine will probably decline steadily throughout the year. At the present time brewers are limited to 93 percent of the malt received a year ago, but stocks of malt are good, and, if the beer is watered judiciously, a volume of shipments equal to those of 1942 may result. Stocks of some types of distilled liquors are still relatively high and shipments, estimated at 85,000 tons in 1943, will surely exceed production. Similarly, although the grape crop is expected to be lower than the 1942 crop, and all raisin grapes must be dried, ample stocks will keep shipments in 1943 above 90 percent of 1942. Altogether it may be estimated that total shipments will decline by only a few percentage points.

Other forces, however, will affect rail shipments. One forecast is that in 1943, 40 percent of the beer will move by rail and only 60 percent by truck. This should nevertheless be taken cautiously. There are about 475 breweries in the country of which from 300 to 350 are engaged in purely local delivery and use trucks. The 25 largest brewers ship all over the country and have always used the railroads. That leaves from 100 to 150 small brewers who ship partly by rail and partly by truck, who may be compelled to put a larger percentage of their sales in freight cars if they are unable to get new tires. However, in some cases the brewers are selling their trucks to common carriers who can get new tires and the beer still rolls out on rubber. It is extremely unlikely that these small shippers will divert such a large part of their traffic to the railroads that the rail portion for the entire country will approach 40 percent.

However, some diversion and some increase in rail shipments appear inevitable. At the present time an increase of from 5 to 10 percent for the year appears warranted, and the figure used in this study is a 10 percent increase in beverages shipments in 1943.

Total Shipments & Rail Shipments of Beverages,
Except Soft Drinks, 1941 - 1943
(000 Gallons)

	1941	1942	Estimated 1943
Shipments:			
Malt beverages 1/	1,801,575	2,023,175	2,036,700
Distilled spirits	134,071	148,582	85,000
Wine	97,138	109,295	100,000
Total	2,032,784	2,281,052	2,221,700
Estimated net tonnage 2/	7,927,850	8,896,100	8,665,000
Estimated total tonnage 3/	9,910,000	11,120,000	10,830,000
Percent change		+ 12.2	- 2.6
Rail tonnage	3,323,394	4,716,893	5,190,000
Percent change		+ 41.9	+ 10.0

1/ Includes tax-free withdrawals from stock.
2/ Estimating 7.8 pounds per gallon.
3/ Estimating containers at 20 percent gross weight of bottled beverages.

ICE

The revenue ice carried by the railroads does not represent the ice used by a carrier for refrigeration of its own freight. It may be sold to a connecting carrier for such purposes, in which case it would be handled as a revenue item. A greater part of the ice would be delivered to consumers other than railroads, such as warehouses, merchant shipping companies and other consumers who do not have sufficient ice available through local delivery by truck. In much of the business the railroads are directly competing with trucks, although the trucks handle the major part of ice.

It is estimated by the National Association of Ice Industries that the quantity of ice produced in 1941 aggregated 34,034,000 tons and in 1942, 34,579,000 tons. This figure is clearly out of line with the 18 percent increase in rail shipments (852,000 tons in 1942 compared with 725,000 tons in 1941). It is believed that the increased volume of ice handled by the railroads resulted from additional demands for shipment and storage of perishable foods, especially of foods moving to export. The increase is therefore a reflection of the greater quantities of fruits and vegetables produced, shipped and warehoused, and the larger tonnages of perishable foods exported.

Any estimate of the amount of revenue ice to be handled by Class I carriers in 1943 is largely conjectural. The National Association of Ice Industries estimates that the refrigeration of railroad cars and of merchant ships will require 6,000,000 tons of ice in addition to the 10,000,000 to 12,000,000 tons normally used for such purposes. The sum total of fruits, vegetables and other perishable items to be shipped and warehoused in this country will undoubtedly be smaller than in 1942; and there should also be a faster turnover of such produce because of the sharp demand for these goods. More ice will probably be handled by the railroads for use in export of perishable commodities. Altogether a 5 percent increase in the tonnage of ice to be handled by Class I carriers in 1943 is estimated, bringing the 1943 figure up to 895,000 tons.

FERTILIZERS

A wide variety of fertilizers are shipped by rail, ranging from alkalis and salts to waste products such as tankage and the dust from steel mill flues. Approximately 80 percent of the fertilizers carried -- if we may believe the one-day studies -- consist of the better known chemicals and mixed fertilizers containing nitrogen, phosphorus and potassium. The remainder represent a miscellany of items, the more important of which are specified below.

Fertilizers in Class 640 According to ODT One-Day Studies

Item	Percent of Total Cars	
Phosphates	11.6	
Agricultural lime	20.6	
Nitrate of soda	10.8	
Sulfate of ammonia	4.5	
Potash salts	10.5	
Manure and manure salts		3.6
Muriate of potash		5.4
Sulfate of potash		1.5

Table Continued:

Item	Percent of Total Cars
Mixed fertilizers and dried fertilizer compounds	22.6
Iron and steel flue dust	8.9
Oyster shells	3.0
Bones and bone meal	1.4
Tankage	2.8
Other 1/	3.3
Total	100.0

1/ Principally tobacco dust and stems, castor pomice, land plaster and guano.

It should be pointed out that the above percentages cannot be relied on to present the relative proportion of use of the various fertilizers. Some of the items listed above represent manufactured fertilizers; others, such as sodium nitrate and ammonium sulfate, may be applied directly to the soil as fertilizers but are more apt to be shipped for combination with other chemicals in "mixed" fertilizers. Comparison of these percentages with production figures in the next table indicate only a rough relationship. The percentage of superphosphate appears to be understated, while the percentage of mixed fertilizers is probably an overstatement. Unfortunately very little information is available on iron and steel flue dust and the other items at the botton of the list.

Production of fertilizers in general appears to have increased in the neighborhood of 12 percent in 1942, and rail fertilizer shipments went up about 15 percent during the year. Most of the expanded production came from the phosphates, potassium salts and agricultural liming material. In addition, imports of nitrate of soda rose from 700,000 tons in 1941 to 1,000,000 tons in 1942. There is reason to think that the miscellaneous group of fertilizers at the end of the list also enjoyed a 10 to 12 percent increase in production, though definite information is in most cases lacking.

Fertilizer production should continue to increase in 1943 but more difficulties will be encountered in the manufacture of many of the items. Competition with ordnance plants for spent sulfuric acid, nitrates and other chemicals will tend to restrict production of superphosphate and mixed fertilizers. This fertilizer is particularly desired for farms in the Southeast. No change is expected in the quantity of mixed fertilizers and the shipping quota calls for a considerable drop in imports of nitrate of soda. On the other hand there is every reason to expect a large increase in the use of agricultural liming materials, particularly if the supply of other fertilizers is limited. The overall picture indicates an increase in new supply of fertilizers of approximately 5 percent. Rail shipments are expected to be 108 percent of 1942.

Production & Rail Shipments of Fertilizers, 1941-1943 1/

(Short tons)

	1941	1942	Estimated 1943
Production:			
Superphosphate (16-18%)	5,055,000	6,045,000	7,000,000
(45%)	260,000	300,000	300,000
Agricultural lime 2/	12,291,700	13,500,000	15,000,000
Nitrate of soda	1,004,000	1,254,000	500,000
Sulfate of ammonia	814,250	816,500	840,000
Potash salts	975,500	1,207,000	1,285,000
Mixed fertilizers	5,700,000	5,800,000	5,800,000
Total	26,099,950	28,922,500	30,725,000
Percent change		+ 10.8	+ 5.3
Rail shipments:	11,736,528	13,445,321	14,520,000
Percent change		+ 14.6	+ 8.0

1/ Data from Chemical Division, WPB.
2/ Includes agricultural lime and limestone.

NEWSPRINT PAPER

Paper products have an important place among the finished articles carried by the railroads. Leaving out of account the tonnage of pulpwood moving in Class 420 (in 1942, tons originated totaled 17,-880,000) and also the tonnage of woodpulp billed in Class 701 (estimated at from 2 to 2.5 million tons in 1942), paper products shipped by rail aggregate a total of approximately 17.5 million tons. Of this quantity, 12,275,000 tons are made up of the paper products listed separately in Classes 650, 651, 694, 695, and 696; and the remainder, estimated at 5,000,000 tons in 1942 falls into Class 701. Included in the latter group are paper boxes, paper scrap, paper towels and tissues, and miscellaneous paper articles.

Shipments of newsprint paper by rail revealed an 8 percent increase in 1942 despite the fact that both production and consumption were lower than in 1941. The statistics recorded below indicate that production and imports were 99 percent of 1941, the drop occurring in domestic production of newsprint. This discrepancy is readily explained by diversion: imports from Canada that normally travel over the Great Lakes were forced onto the railroads in 1942 because of the higher priority given to other commodities carried on the Lakes. Some of the 200,000 tons of newsprint paper imported from Newfoundland may also have come in by rail.

A 1943 estimate on the tonnage of newsprint to be shipped by rail is extremely hazardous. A 10 percent cut in newsprint has already been made by the War Production Board because of the shortage of pulpwood. Further reductions may be in store if logging does not improve. On the other hand, some additional diversion to the rails may occur if the Great Lakes situation continues critical. To what extent these forces may come into play it is impossible to tell. However, the 10 percent cut in production is definite; consequently rail shipments for 1943 are placed at 90 percent of 1942.

Production, Imports & Rail Shipments of Newsprint Paper, 1941-3

(Short tons)

	1941	1942	Estimated 1943
Domestic production	1,015,000	953,000	857,700
Imports	2,987,000	3,007,000	2,706,300
Total	4,002,000	3,960,000	3,564,000
Percent change		- 1.0	- 10.0
Rail tonnage	1,301,583	1,406,516	1,266,000
Percent change		+ 8.1	- 10.0

PRINTING PAPER, NOS

Printing paper covers both book paper and groundwood printing paper. Paper used for printing is of many grades and kinds; whether used for books, periodicals or any other publications. The groundwood paper listed below has a constituency of 50 percent of more groundwood, while the larger volume of book paper is less than 50 percent groundwood and has been treated chemically with caustic soda and sulfide and bleached to the shade desired with chlorine. It is to be noted that the railroads report most of the tonnage of book paper as printing paper. Actually a very small part of the book paper is used for book publishing.

Production of book and printing paper fell off 13 percent in 1942, the drop occurring chiefly in the output of book paper. However, this would not reflect consumption or shipments, because of the peculiar cycle in distribution which took place. In the last months of 1941 and for the first two months of 1942, production was carried along at a very high rate of operations because the industry feared limitation orders later on. Large shipments of paper were made in the last quarter of 1941 and the first quarter of 1942 far above actual requirements. As a matter of fact, consumption of paper dropped off with the decline of commercial advertising and both production and shipments fell off until October when consumers began to renew their orders. In November Limitation Order M-241 limited production to 80 percent of the peak period. It is not believed, however, that this will create a hardship.

Actually production and shipments have been at a fairly high level during the first months of 1943. At the present level of operations production of book and printing paper should be 96.5 percent of 1942. Consequently, the rail tonnage figure has been reduced only 2 percent.

Production & Rail Shipments of Printing Paper, 1941-3

(Short tons)

	1941	1942	Estimated 1943
Production:			
Book paper	2,034,300	1,711,700	1,650,000
Groundwood printing paper	641,409	609,100	590,000
Total	2,675.709	2,320,800	2,240,000
Percent change		- 13.3	- 3.5
Rail shipments:	2,308,877	2,249,846	2,205,000
Percent change		- 2.6	- 2.0

ALCOHOL

Due primarily to the boost given ethyl alcohol, total alcohol production rose 28 percent in 1942. The increase was accomplished largely by taking over the production of grain distilleries in the midwest and elsewhere and by the construction of new plants for alcohol manufacture. Total stocks of alcohol rose from roughly 7 million gallons at the beginning of 1942, to 63 million gallons on January 1, 1943. Ethyl alcohol alone represented 55 million gallons of these stocks.

Rail shipments reflected part, but not all, of this activity. Class I carriers reported 680,723 tons of alcohol originated in 1942 compared to 572,758 tons in 1941, a gain of 18.9 percent. The discrepancy in this case is not due to the alcohol stocks, for most of these were transported to petroleum refineries and other centers of consumption. Defense Supplies Corporation states that their handling of the situation resulted in a marked diversion to tank truck and river barge. This was done so as to minimize the demand on railway tank cars. Alcohol going into export channels moved by drum. In the Maryland, Kentucky, Pittsburgh, and California areas most of the alcohol was moved by truck supplemented by a barge movement in the East from Pittsburgh and Louisville to Charleston, West Virginia. Commercial alcohol, however, still moves largely by tank car.

In 1943 production of alcohol will reach a total of 654 million gallons, with ethyl alcohol accounting for 518 million gallons, with ethyl alcohol accounting for 518 million gallons. This marks an increase of 57 percent over 1942. Stocks will aggregate 118 million gallons on July 1 and thereafter decline as the synthetic rubber program gets into gear, falling to 92 million gallons on January 1, 1944. Consumption will approximate 60 million gallons a month towards the end of the year and less than a month's supply is expected to remain in stock by January 1, 1945. However, this program as mapped out is subject to change for a number of reasons.

Again rail shipments are expected to fall behind the increase in production. This is based upon the assertions of Defense Supplies Corporation representatives that their program calls for continued diversion from tank cars to tank trucks and barges. Just how effective this program will be is hard to say. Undoubtedly there will be a substantial increase in rail shipments, and, pending further information, this increase is estimated at 40 percent.

Production & Rail Shipments of Alcohol, 1941 - 1943

	1941		1942		1943	
	(000 gals.)	(Tons)	(000 gals.)	(Tons)	(000 gals.)	(Tons)
Production:						
Ethanol	217,750	741,400	297,785	1,014,000	518,000	1,763,820
Methanol	61,870	204,480	66,000	218,130	80,000	264,400
Butanol	29,120	99,000	31,620	107,500	35,300	120,000
Ethylene glycol	16,277	75,770	20,940	97,475	20,900	97,290
Total		1,120,650		1,437,105		2,245,510
% Change				+ 28.2		+ 56.9
Rail shipments:		572,758		680,723		953,000
% Change				+ 18.9		+ 40.0

SULFURIC ACID

One of the most significant increases of traffic in the entire rail classification occurred in the case of sulfuric acid. This increase is significant not only for its size (63 percent) but because it involved tank car capacity.

It is also noteworthy that production figures fail utterly to denote such an increase. The publication "Chemical and Metallurgical Engineering" reported the manufacture of 11,040,000 tons of sulfuric acid in 1941 and 12,515,000 tons in 1942, an increase of 13.4 percent. The consumption of this acid by industries was given as follows:

Tonnage Consumed

Use	1941	1942
Chemicals (including explosives)	1,790,000	2,250,000
Fertilizers	2,500,000	2,950,000
Petroleum	1,400,000	1,650,000
Coal products	940,000	970,000
Iron and steel	1,500,000	1,600,000
Other metallurgical	800,000	840,000
Paints and pigments	700,000	760,000
Explosives (industrial only)	190,000	195,000
Rayon and cellulose	550,000	625,000
Textiles	165,000	145,000
Miscellaneous	500,000	530,000
Total	11,040,000	12,515,000

Even this increase is doubted by sulfuric acid experts in the Chemical Division, WPB, for the reason that they believe it includes a certain volume of spent acid which had been regenerated. It will be remembered that shipments of sulfur actually declined in 1942, although stockpiles in the hands of consumers would have permitted of increased consumption during the year.

It is the spent acid which is the key to the situation. Ordnance plants and particularly nitrating plants use high strength sulfuric, generally 109 percent concentrated (oleum), and from their operations recover nitric acid and sulfuric acid, the latter reduced to 50 to 80 percent strength. Since only part of this acid can be reused by the ordnance plant, the bulk of the acid is shipped to regenerating plants which build up the strength and ship to a fertilizer plant or some other consumer. Thus the same acid may be reworked and reshipped several times.

Although this procedure requires a great deal more tank car capacity, it is claimed to be economical from the standpoint of chemical engineering. Fewer materials and facilities need to be employed in the manufacture of sulfuric acid. Moreover, requirements for the transportation of sulfur are lessened.

Although many of the new ordnance plants have been provided with their own regenerating equipment, there will probably continue to be large quantities of sulfuric shipped by rail. (Incidentally, it may be pointed out that an ordinary tank car will not be affected by sulfuric acid which is above a certain strength; it is the very dilute acid which corrodes the inside.) Chemicals, explosives, petroleum, refineries, the iron and steel industry and other metallurgical plants will require larger amounts of sulfuric. This will overshadow the decrease of requirements for paints and pigments, rayon and cellulose, textiles and other industries. The result would seem to indicate a production of 13.5 million tons of acid in 1943, an increase of roughly 8 percent.

However, shipments by rail are expected to be much higher than this. Continuation of the trend in quarterly shipments leads to the belief that rail loadings of sulfuric acid may reach 6,670,000 tons in 1943, an increase of 44 percent over the past year.

Production & Rail Shipments of Sulfuric Acid, 1941 - 1943

(Short tons)

	1941	1942	Estimated 1943
Production:	11,040,000	12,515,000	13,500,000
Percent change		+ 13.4	+ 8.0
Rail shipments by Quarters:			
First	613,195	928,935	1,550,000
Second	680,725	1,089,106	1,650,000
Third	734,520	1,223,793	1,720,000
Fourth	820,366	1,390,629	1,750,000
Total	2,848,806	4,632,463	6,670,000

EXPLOSIVES

For obvious reasons the discussion of this subject will be brief. This class includes not only loaded but also unloaded ammunition. There may, consequently, be two movements of the same explosive, e.g., once as powder and the second loaded into a bomb or other projectile. Shell casings, cartridge shells and empty projectiles in general, move in Class 701, Manufactures and Miscellaneous, NOS.

Rail shipments of explosives in 1942 were more than six times the quantity shipped in 1941. Quarterly tonnages are given below. In 1943 the output of explosives measured in dollar value is estimated by the Statistics Division at 248 percent of 1942. However, this figure is biased upwards by the emphasis given to high explosives which cost more than other explosives. It is felt that an estimate of 1943 production at 200 percent of 1942 is more reasonable. Consequently, the 1943 tonnage of rail shipments of explosives has been set at 10,670,000 tons, an increase of 100 percent over 1942.

Explosives

	1941	1942	1943
First quarter	117,140	730,516	2,300,000
Second quarter	184,348	1,123,577	2,600,000
Third quarter	253,412	1,600,704	2,850,000
Fourth quarter	284,959	1,822,584	2,920,000
Total	837,388	5,337,381	10,670,000

COTTON CLOTH AND COTTON FABRICS, NOS

Rail shipments of cotton cloth and fabrics jumped by more than 80 percent in 1942, a steady increase being registered throughout the year. No correspondence to this trend can be found in the statistics of production: in 1942, 11,400 million yards of cotton cloth were produced, compared to 10,522 million yards in 1941, an increase of only 8.3 percent. Although no figures on stocks are available, it is known that inventories in the hands of civilian garment cutters were high. However, this would not explain the unusual increase in the rail figure.

A more valid explanation is that the pattern of shipments has been considerably altered by wartime, so that many more moves are made by the cloth and fabrics. Whereas formerly from two to two and a half moves were made by each yard of cloth, today four to five shipments are taking place. These can be compared in the following manner:

Civilian	Military
1. Mill to converter.	1. Mill to converter.
2. Converter to manufacturer.	2. Converter to Quartermaster Corps.
3. Manufacturer to dealer.	3. Quartermaster Corps to clothing manufacturer.
	4. Manufacturer to Quartermaster Depot.
	5. Depot to Army camp.
	6. Perhaps between camps to balance inventories, and so forth.

Accordingly the rise in rail shipments far outdistances the production of cotton cloth. And although production is expected to decline in 1943, there is every reason to believe that the multiplicity of shipments will continue. Analysis of the quarterly figures of originated tonnage below indicates that the first part of 1943 should be well above the first quarter of last year, with the difference between the two years narrowing towards the end of 1943. In all a 25 percent increase appears to be indicated unless production of cotton cloth and fabrics is drastically reduced. This would bring the tonnage of this class up to 1,254.000 tons.

BURLAP, GUNNY AND JUTE BAGS AND BAGGING

This class represents three types of movement: (1) shipment of burlap and other cloth to the mills; (2) shipment of lined and unlined bags from the mills; (3) shipment of old bags back to the mills for repair. Normally most of the bags are used for feed, fertilizer, potatoes, flour, meal and grain and other rough and bulky commodities, and also for baling merchandise. M-47 issued in December 1941 controls acquisition and distribution of burlap and burlap products and limits the use of burlap, other than the quantity stockpiled, to agricultural bags. At present two-thirds of the burlap is going to Army use for sandbags, supply bags and camouflage cloth.

One effect of M-47 and of M-221 which controls production, sales and disposition of burlap bags, is that reuse of bags has been greatly increased. A burlap bag may be used four or five times and many more were shipped back to mills and to shippers of agricultural products in 1942. Thus, despite the fact that production of burlap products increased only 4 to 5 percent in 1942, rail shipments were nearly a third greater as compared with 1941.

In 1943 it is expected that approximately 650 million yards of burlap will be consumed in increased consumption of 200 million yards over 1942. This material will have to come out of stock since it is estimated that imports will continue at a low level (estimated at 250 million pounds). More bags are required this year to handle shipments of feed, fertilizer and grain products, and it is expected that reshipment of bags will remain at 1942 levels. Consequently, it is estimated that the tonnage of bags and bagging material to be originated by Class I carriers in 1943 will increase by 20 percent.

Consumption of Burlap and Rail Loadings of Bags and Bag Material

1941 - 1943

(Short tons)

	1941	1942	1943
Consumption of burlap cloth (000 yards)	436,000	450,000	650,000
Percent change		+ 3.2	+ 44.4
Rail loadings of burlap bags & bagging	279,482	370,313	444,000
Percent change		+ 32.6	+ 20.0

CANNED FOOD PRODUCTS

A substantial increase in canning occurred in 1943. While statistics on all canned foods are not available, the production figures included in the following table are believed to cover more than 80 percent of the total volume of canned foods. They indicate a general increase in canned foods of about a sixth, with especial increases in fruits, fruit juices, fresh and processed vegetables, and dairy products.

Production and Rail Tonnage of Canned Food Products, NOS, 1941-3 [1]
(000 lbs.)

Production	1941	1942	Est. 1943
Fish	875,000	657,000	624,000
Vegetables (includes soup & vegetable juices)	6,525,000	7,244,000	6,940,000
Fruits (includes juices)	3,735,000	5,001,000	3,900,000
Dairy Products	3,555,000	3,830,000	3,345,000
Canned Meat	1,650,000	2,310,000	2,900,000
Processed Fruit	515,000	569,000	585,000
Processed Vegetables	1,500,000	1,941,000	2,000,000
Total	18,355,000	21,552,000	20,294,000
Tons	9,178,000	10,776,000	10,197,000
Estimated weights of containers	1,836,000[2]	2,155,000[2]	2,243,000[3]
Tonnage of canned products	5,507,000	6,465,500	6,220,000
Percent Change		+ 17.4	- 3.8
Rail Tonnage	7,066,627	9,904,258	9,510,000
		+ 40.2	- 4.0

[1] The packing year has been converted to a calendar year basis.
[2] Containers estimated at one-fifth the weight of contents.
[3] Containers estimated at 22% of content weight because of increased use of glass jars.

For the remarkable increase of shipments by rail of canned foods, the following factors are believed responsible: (1) diversion from the Panama Canal; (2) diversion from truck, especially for quantities consigned to Army camps and products going into export. In 1941, approximately 770,000 tons of canned food products moved through the Panama Canal; in 1942, less than 20,000. Thus the closing of the Canal and shift of this tonnage to the rails would account for a little more than half of the increase in tonnage originated. No adequate data on truck movements are available, but the trucks play a predominant part in local distribution of canned foods. Almost all of the shipments from the original packers go by rail. It is believed that the location and buying methods of many Army camps and the increase in exports, most of which arrive at the ports by rail, would account for the shift of considerable quantities of canned foods to the rails.

The statistics presented above indicate a decline of approximately 4 percent in the canning of products covered. The Office of Price Administration expected a 7.3 percent decrease in shipments of canned soups, vegetables, fruit and dairy products for civilians and the government.

Shipments of Canned Soups, Vegetables and Fruit*
(Short Tons)

	1942	Est. 1943	
To the Government	1,037,190	2,510,650	
To Civilians	4,499,707	2,623,500	
Total	5,536,897	5,134,150	(-7.3%)

* Excludes canned meats and fish.

No more diversion from the Panama Canal is possible and not a great deal of diversion from trucks is expected. Consequently, a 4 per cent decline in rail shipments of canned foods has been estimated for 1943.

MANUFACTURED TOBACCO PRODUCTS

Consumption of tobacco products increased about 10 percent in 1942. This is based upon statistics of the tax-paid withdrawals of the various tobacco products reported by the Treasury Department, Internal Revenue Division. The largest increase took place in the consumption of cigarettes, with 235,840 million pieces consumed in 1942 compared to 206,424 million pieces in 1941 (+18.4%). Consumption of cigars was up 9.5 percent, with 6,339 million units consumed in 1942 compared with 5,787 million units in 1941. On the other hand, the output of manufactured tobacco and snuff declined by 4 percent in 1942. Exports doubled with the largest increase taking place in cigarettes.

The figures of tonnage originated by Class I carriers correspond very closely with the trend of consumption and exports reported above. These show an increase in rail loadings of 10.6 percent in 1942.

An eleven percent increase in consumption is expected in 1942 and a very large increase in the quantity of tobacco products shipped abroad. The 1942 tobacco crop was very good and every indication points to a continuation of the upward trend in consumption of tobacco products, especially of cigarettes. As shown in the following table, a 12 percent increase in rail shipments has been estimated.

Domestic Consumption, Exports and Rail Shipments of Tobacco Products
1941-3
(Short Tons)

Domestic Consumption 1/	1941	1942	Est. 1943
Cigarettes 2/	309,636	353,760	390,000
Cigars 2/	69,444	76,068	77,520
Manufactured tobacco & snuff	169,152	160,843	161,000
Exports			
Cigarettes 1/	12,000	27,000	54,000
Cigars	170	525	480
Manufactured tobacco & snuff	2,460	2,835	4,000
Total Consumption & Exports	562,862	621,031	687,000
Percent Change		+ 10.3	+ 10.6
Rail Tonnage	303,967	335,485	376,000
Percent Change		+ 10.6	+ 12.0

1/ Reported by the Department of Commerce. Includes imports.

2/ Weight estimated as follows: 1,000 cigarettes = 3 lbs; 1,000 cigars = 24 lbs.

PAINTS IN OIL AND VARNISHES

This class includes all paints, lacquers and varnishes shipped by rail. From the figures of tonnage originated by Class I carriers it is apparent that shipments of these products by rail increased by 14 per cent in 1942.

The only statistics of paint operations available are figures of the dollar value of sales as reported by the National Paint, Varnish & Lacquer Association. Sales were $530,000,000 in 1942 compared with $555,000,000 in 1941, a decrease of a little more than 5 percent. However, this is not an accurate measure of the production of paint products, because the average price of a gallon of paint sold to the government ranges from $.85 to $1.30 while paint sold to civilians brings from $1.30 to $1.60 per gallon. The average price in 1942 is estimated by the Association at $1.10 and for 1941, $1.50. Applying these figures and estimating the average weight of a gallon of paint at 14 pounds (paints, lacquers and varnishes range from 22½ lbs. per gallon in the case of thick paints to 7½ lbs. per gallon in the case of some varnishes), an increase in production of roughly 14 percent may be estimated.

In 1943 a considerable decline in paint used for new construction is anticipated, although there will be a great deal of repainting within the limitations of the labor available for such work. Order M-56 limits the use of tung oils and certain resins in paint manufacture, but no further restrictions are anticipated at this time. For the first two months of the year sales of paint, lacquer and varnish were 17.3 percent lower than for the same months of 1942 (dollar value). Because of the expected abrupt drop in construction after the middle of the year, 1943 rail shipments of paint products is placed at 75 percent of 1942.

Sales, Estimated Tonnage and Rail Tonnage of
Liquid Paint, Lacquer and Varnish, 1941- 3

	1941	1942	Est. 1943
Dollar value of sales	$555,398,819	$529,745,027	$380,000,000
No. of Gallons (est.)	370,266,000	423,796,000	317,847,000
Tonnage (est.)	2,591,860	2,966,570	2,225,000
Percent Change		+ 14.4	- 25.0
Rail Tonnage	370,885	421,082	316,000
Percent Change		- 13.8	- 25.0

FURNACE SLAG

More than 19 million tons of furnace slag were sold or used by producers in 1942, a 30 percent increase over the quantity sold or used by producers in 1941. Class I carriers reported tonnage of slag originated in 1942 at 9,969,000 tons, an 18 percent increase over the previous year's performance.

The chief reason for the greatly increased use of slag last year was the expanded construction program. More than 75 percent of the slag is used in connection with some phase of construction and most of the remainder as railroad ballast. Some slag must continually be moved away from the blast furnaces; but the slag companies that handle this movement also try to market the slag. The 1942 pattern of use was as follows:

Use	Percent of Total
Road building (incl. bridges and other structures)	45
Railroad ballast	18
Fill and subbase cushion courses	12
Cement manufacture	9
Airport runways	5
Other*	11

* Includes mineral wool, roofing slag, fertilizer, and other uses.

The greatest increases in use occurred in cement manufacture, rail ballast, airport runways and fill and subbase cushion courses. The latter use includes a great deal of granulated slag employed on airport runways, for which slag is well suited. Approximately 75 percent of the slag is produced in three states, Alabama, Ohio and Pennsylvania. About the same percentage of the slag carried by rail originates in these states.

It will be noted that rail tonnage did not increase as fast as production in 1942. The National Slag Association reports that in 1941 slag moved as follows: by rail--55%; by truck--43%; by water--2%. In 1942 the percentages were: rail--52%; truck--47% and water--1%. The decrease in the proportion of rail traffic is believed to have resulted from the shift to truck of one large producer in the Ohio area.

In 1943, sales of slag are expected to decline with the trend in construction. Although the market has held up fairly well in the first months of the year, there are signs that the record volume sold or used by producers in 1942 will be well above 1943. The National Slag Ass'n. expects business to drop off sharply after the middle of the year. No information is available as to possible further diversion to or from the railroads. Consequently, the tonnage to be originated in 1943 has been estimated at 80 percent of the 1942 figure. It is not believed that the demand for slag will decline as much as the demand for other aggregates.

Slag Sold or Used by Producers and Rail Shipments, 1940 - 3
(Short Tons)

	1940	1941	1942	Est. 1943
Slag sold or used by producers 1/	10,353,042	14,678,266	19,122,718	15,300,000
Percent Change		+ 41.8	+ 30.3	- 20.0
Rail Shipments	5,483,665	8,471,781	9,968,756	8,000,000
Percent Change		+ 54.5	+ 17.7	- 20.0

SCRAP IRON AND SCRAP STEEL

Approximately 60.5 million net tons of scrap were consumed by the iron and steel industry in 1942, a slight decrease from the 61 million tons of estimated consumption in 1941. Because of an increase in the quantity of home scrap used by furnaces, the consumption of purchased scrap declined from an estimated 27.25 million tons in 1941 to 26.5 million tons in 1942. Nevertheless, total shipments of scrap aggregated 28.5 million tons in 1942, an increase of 15 percent, and rail shipments totaled 18.6 million tons, or 14.5 percent above 1941.

It should be pointed out that statistics of scrap consumption and inventories for the years prior to January, 1942 must be used cautiously because of the incomplete coverage. In the past 16 months, however, the Bureau of Mines has made an intensive revision of its statistics and present data may be regarded as quite reliable.

The demand for scrap is inversely related to the supply of pig. The demand for both is, of course, a factor of the rate of operations of the iron and steel industry. Movements of scrap, however, are associated with requirements for scrap purchased on the outside as distinguished from home scrap recovered from operations within the iron and steel plants themselves. About 1.5 million tons of home scrap produced by integrated mills is shipped to other iron and steel companies, and is consumed as purchased scrap.

In 1940 slightly more pig was used than scrap in iron and steel production, because there still existed excess pig capacity. Generally, furnaces consume equal proportions of pig iron and scrap. In 1941, however, more scrap was used as a shortage in pig had developed. Again in 1942 the situation was reversed. More pig was used because of a general shortage of scrap, and particularly of purchased scrap. Inventories of scrap had dropped from 7.8 million gross tons at the end of 1940 to 4.4 million tons at the end of 1941: stocks of purchased scrap alone declined by 2.5 million tons. A nationwide campaign was launched resulting in an increase of stocks of purchased scrap to 5.5 million tons. Movements of this scrap--industrial and consumers scrap--reached a peak in the last quarter of 1942.

Because of new construction in the steel industry more pig will be available in 1943, and a higher percentage of pig to total consumption should obtain. The Steel Division estimates an even distribution of 50 percent pig and 50 percent scrap. This means a requirement for 63 million net tons of scrap. Using the percentage of consumption in the first months of 1943 as reported by the Bureau of Mines (50% pig, 28.1% home scrap and 21.9% purchased scrap) it may be calculated that total consumption of purchased scrap for the year will approximate 27.6 million tons. No withdrawals from stock are anticipated by the Steel Division; consequently, total transportation requirements are 27.6 million tons, a decline of 3.7 percent from estimated requirements in 1942. To remain on the conservative side, however, no change in rail shipments has been estimated.

Furnace Consumption of Pig Iron and Scrap
Estimated Movements and Rail Shipments of Scrap, 1941-3

(Short Tons)

	1941	1942	Est. 1943
Total furnace consumption	118,300,000[1]	119,719,000[2]	126,000,000[3]
Pig Iron consumed	57,330,000	59,258,000	63,000,000
Scrap consumed	60,970,000	60,461,000	63,000,000
Home scrap	33,720,000	34,094,000	35,400,000
Purchased scrap	27,250,000	26,467,000	27,600,000
Withdrawn from inventory	2,460,000	----	----
Added to inventory	----	2,084,000	----
Total Movement	24,790,000	28,551,000	27,600,000
Percent Change		+ 15.2	- 3.7
Rail Shipments	16,269,381	18,627,513	18,628,000
		+ 14.5	+ 0.0

[1] Estimated from monthly reports of Bureau of Mines and statistics furnished by the American Iron and Steel Institute.

[2] Reported by the Bureau of Mines

[3] Estimated by Steel Division, WPB.

PAPER BAGS AND WRAPPING PAPER

Despite a slight decline of 3 percent in production of paper bags and wrapping paper, the railroads increased their loadings of these items by 4 percent. Again, the reason for the discrepancy is the very high rate of operations of the paper industry during the last months of 1941 and the first two months of 1942. A great many of the paper products turned out in this period were not shipped until 1942; consequently, shipments exceeded production in 1942.

Bags and wrapping paper come under Limitation Order M-241, which limits production of newsprint paper to 90 percent of the base period, printing paper to 80 percent of the base period and wrapping paper to 85 percent of the base period (last quarter of 1941 and first quarter of 1942). Therefore, it may be expected that production and shipments of paper bags and wrapping paper will be reduced in 1943. Some inventories of wrapping paper still exist, and shipments may not decline as much as production. Total output is estimated by the Printing and Publishing Division, Office of Civilian Requirements, at 2,270,000 tons (-9%) based on operations during the first quarter of 1943. Rail loadings of paper bags and wrapping paper have been estimated at 1,950,000 tons, a decline of 7.3 percent below 1942.

Production and Rail Shipments of Paper Bags and Wrapping Paper, 1941-3
(Short Tons)

	1941	1942	Est. 1943
Production	2,572,681	2,498,300	2,270,000
Percent Change		- 2.9	- 9.1
Rail Tonnage	2,025,875	2,102,827	1,950,000
Percent Change			- 7.3

PAPERBOARD, PULPBOARD AND WALLBOARD

Paperboard for containers and building makes up the bulk of this class. Statistics indicate that in 1942 paperboard for containers (folding and set-up box boards and container board) represented five-sixths of total production. Building board accounted for approximately 11 percent of the remainder. Other small items included here are cardboard, binders board, press board, dense fibre and solid wood pulpwood. Most of the board in this class is billed in the ODT one-day studies: as pulpboard (64%); other billings are fibre board (8%); wallboard (6%); and box board (10%); most of the remainder is made up of chipboard and strawboard.

In 1942 both production and rail shipments of the items represented in this class declined, the first by 6 percent, the second by a fraction of 1 percent. The explanation for the maintenance of shipments in the face of lower production is the same as that given for other paper products: the peak output was of the last quarter of 1941 and the first quarter of 1942 exceeded requirements, and a great deal of this output did not move until later in 1942. This peak production turned out to be a false boom and paper requirements failed to go up in 1942 as anticipated.

By the end of 1942 inventories had been drawn down and production of pulpboard for containers and for building revived. The rate of output of building wall board, a desired substitute for lumber, has been quite high for the six months prior to May, 1943, but should level off later during the year. However, a steadily growing demand for paper containers as substitutes for wood and tin containers will be felt. The glass industry is at capacity and container requirements for domestic use and exports can only be satisfied by expanded production of pulpboard and fibre board. The small items in the class should also increase: bindersboard for military uses, pressboard for gaskets and other purposes; solid wood pulpboard for closures and dense fibreboard as a leather substitute.

By and large it is estimated that production of the pulpboard, paperboard and fibreboard in this class will increase 12 percent in 1943. Rail shipments are set at 4,525,000 tons, 14 percent above 1942.

Production & Rail Shipments of Paperboard, Pulpboard & Wallboard, 1941-3 1/

(Short Tons)

Production	1941	1942	Est. 1943
Building board	580,000	857,000	900,000
Container board	4,214,000	3,706,000	4,250,000
Folding boxboards	1,798,000	1,708,400	1,900,000
Set-up boxboards	1,188,000	1,125,000	1,100,000
Other 2/	467,000	373,000	550,000
Total	8,247,000	2,769,400	8,700,000
Percent Change		- 5.8	+ 12.0
Rail Shipments	3,977,765	3,969,583	4,525,000
Percent Change		- 0.2	+ 14.0

1/ Data furnished by Pulp and Paper Section, OCR.

2/ Includes cardboard, binders board, pressboard, dense fibre board, solid wood pulpboard.

BUILDING PAPER AND PREPARED ROOFING MATERIAL

This class consists largely of prepared roofing material, tar-saturated felts, asphalt shingles, sheathing and asbestos paper. The ODT one-day studies indicate that prepared roofing accounts for 34 percent of the cars, asphalt shingles for 29 percent and non-asbestos roofing paper for 20 percent. The rest are reported as asbestos shingles and roofing and non-asbestos building paper.

Since all members of this class are associated with construction, their production and shipments reflect the trend in building. In 1942, production of the items included in this class increased 13 percent and shipments 23 percent. The discrepancy in rates of increase is believed due to the fact that in 1941 a great deal of production and stockpiling was carried on, while consumption and shipments were decidedly higher than production would indicate.

Whatever the reason for the difference in increase of production and rail shipments in 1942, it may safely be assumed that both will decline in 1943. The decline of a third in the construction program, in the opinion of the Building Materials Division, will reduce production of prepared roofing materials by 20 percent. A decline of 12 percent is estimated for building paper. Consequently, rail shipments have been reduced by 15 percent.

Production and Rail Shipments of
Building Papers and Prepared Roofing Materials, 1941-3

(Short Tons)

Production	1941	1942	Est. 1943
Building paper 1/	2/ 721,000	910,000	800,000
Prepared building materials	3,083,000	3,387,000	2,678,000
Total	3,803,000	4,297,000	3,478,000
Percent Change		+ 13.0	- 19.1
Rail Shipments	2,071,541	2,545,757	2,164,000
Percent Change		+ 22.9	- 15.0

1/ Including sheathing, asbestos paper and roofing felts. Figures furnished by Pulp and Paper Section, OCR.

2/ Rolled roofing, asphalt shingles, asphalt & tar-saturated felts. Statistics furnished by Building Materials Division, WPB.

BUILDING WOODWORK (MILLWORK)

This class consists of fabricated woodowrk shipped for new construction and repair. Of the cars reported in the ODT studies, 25 percent carried sashes, 20 percent carried doors, 10 percent frames, 10 percent molding, 4 percent screens, and the remainder miscellaneous and unspecified woodwork.

The Millwork Section, Lumber Division, WPB, informs us that there are no statistics of production, sales, shipments or consumption of millwork available. The only known trend in the industry is that indicated by rail shipments: these declined from 618,000 tons in 1941 to 561,000 tons in 1942 (9%). As shown by the quarterly figures, decline was greater in the last half of the year.

	1941	1942	% Change
First Quarter	147,618	133,902	- 9.3
Second Quarter	145,809	140,753	- 3.5
Third Quarter	163,801	144,258	-11.9
Fourth Quarter	160,665	142,293	-11.4
Total	617,893	561,206	- 9.1

It is believed shipments of millwork declined because of the shift from civilian to military construction. Army barracks and depots do not employ as much woodwork as residential buildings.

In 1943, millowrk production should decline for two main reasons (1) the general 35% drop in construction; (2) the general shortage of lumber. It is considered safe to assume that rail shipments of building woodwork will decline 30 percent in 1943.

SOAP AND WASHING COMPOUNDS

Soap accounts for an estimated 90 percent of all the production of this class and for 88 percent of the carloads reported on the ODT one-day studies. The remainder is made up of various washing and cleaning powders and compounds.

It is estimated by the Chemical Division that soap making declined by approximately 6 percent in 1942. Production figures are based on reports of the American Soap and Glycerin Association which covers 90 percent of the industry. Decreased production resulted from lesser quantities of fats, oils and chemicals available for soap during 1942. The decline was greatest in the output of laundry soap, granulated soap and soap chips and flakes.

It will be noted that the tonnage of Class 698 originated by the railroads increased a little more than 4 percent in 1942. This is belived due to the following factors: (1) Although figures on stocks are lacking, larger withdrawals from inventory were made in 1942; (2) greater quantities were shipped to Army camps and for Lend-Lease and these movements are generally by rail.

No change in total production of soap and washing compounds is expected in 1943. 1,800 million pounds of fats and oils have been allocated for soap manufacture, substantially the same as the quantity allocated in 1942. Since it is estimated that 55 pounds of fat are required for 100 pounds of soap, total soap production in 1943 may be estimated at 3,275 million pounds, or 1,637,500 tons.

Because production of soap is being held to a constant level, the 1942 figure of 1,400,000 tons has been retained as the 1943 estimate of tons of soap and washing compounds to be originated by Class I carriers.

Production of Soap. Rail Shipments of Soap and Washing Compounds, 1941-3
(Short Tons)

	1941	1942	Est. 1943
Bar soap			
Toilet	202,440	189,050	187,800
Laundry	613,430	556,590	560,930
Granulated & Powders	441,850	412,610	409,970
Soap Chips & Flakes	207,150	193,440	192,220
Washing & Scouring Powders	212,030	198,000	196,960
Other 1/	75,300	87,310	89,620
Total	1,752,200	1,637,000	1,637,500
Percent Change		- 6.4	+ 0.0
Rail Tonnage	1,341,501	1,400,249	1,400,000
Percent Change		+ 4.4	+ 0.0

1/ Includes textile soap, potash soap, mechanics soap, shaving soaps, liquid soap and others.

FLAT GLASS OTHER THAN PLATE

Window glass makes up more than 90 percent of shipments included in this classification. In 1942, production and shipments of window glass declined, the first by 5 percent and the second by 20 percent. Indications are that production was maintained at a higher rate than requirements in 1942 and that additions to stock were made. The reason for the decline was the shift in construction, from civilian to military and the fact that the Army buildings and others constructed in 1942 did not employ as much window glass as the large volume of residential construction in 1941.

There is no average factor for converting units of window glass and the units of weight because of the varying thicknesses of glass. Consequently, no estimate of actual tonnage of production has been made. It should be pointed out, however, that window glass production in the first three months of 1943 totaled 3,527,000 boxes, a decline of 25 per cent below the first quarter of 1942. Because expected continued drop in construction in 1943, it is estimated that rail shipments during the year will be 30 percent less than in 1942.

Production of Window Glass and Rail Shipments of Flat Glass, 1941-3

	1941	1942	Est. 1943
Production of window glass (boxes)	16,552,225	15,789,207	11,050,000
Percent Change		- 4.6	- 30.0
Rail Shipments	570,602	455,339	319,000
Per Cent Change		- 20.2	- 30

GLASS BOTTLES, JARS AND JELLY GLASSES

The major products included in this class are glass bottles with 85 percent of the carloads reported in the ODT one-day studies, glass jars with 10 percent of total carloads, and the remaining 5 percent made up of battery jars, fruit jars and jelly glasses. Review of the waybills indicate that a number of carloads of empty beer bottles were included in this class, and it is believed that a considerable part of the tonnage reported here consists of empty bottles moving back to bottling works.

Production of containers increased from 71 million gross in 1941 to nearly 80 million gross in 1942. Actually the increase was greater than that reached by the number of containers produced, since there was a shift from the smaller to the larger bottle and jar. Rail shipments reflected the increased production of glass containers with a tonnage of 3,364,000 tons, 26 percent above the tonnage carried in 1941.

Greater use of glass containers as substitutes for tin cans is expected in 1943. For the first quarter of this year production of glass containers was 22 million gross, 10 percent higher than during the first quarter of 1942. For the same period, shipments were 17 percent higher than 1942. The Chemical Division estimates total production in 1943 at 90 million gross, which will increase the tonnage of container production by an estimated 24 percent. It is believed that rail shipments, supplemented by some withdrawals from inventories of glass bottles and jars, will increase 30 percent during the year.

Production & Rail Shipments of Glass Containers, 1941 - 3

	1941	1942	Est. 1943
Production (000 gross)	71,000	79,500	90,000
Est. Tonnage	2,982,000 1/	3,617,250 1/	4,500,000 1/
Percent Change		+ 21.3	+ 24.4
Rail Shipments	2,661,620	3,364,000	4,373,000
Percent Change		+ 26.4	+ 30.0

1/ A gross estimated at 84 lbs. in 1941, 91 lbs. in 1942, 100 lbs. in 1943.

MANUFACTURES AND MISCELLANSOUS, NOS

Class 701, Manufactures & Miscellaneous, NOS, is the most heterogeneous in the rail classification, including as it does everything from hairpins to heavy artillery. Items not reported in previous classes and some items which should have been billed previously--e.g., alcohol, sugar, salt cake, flue dust, wallboard, pipe and pipe fittings--fall into this railway catch-all. Altogether, the hundreds of items included here totaled 86 million tons in 1942, making Class 701 the third largest in the rail classification, exceeded only by bituminous coal and iron ore.

Manufactured commodities listed here are both civilian and military, and a great many of these commodities, for instance, food, clothing, medical supplies and other merchandise are consumed jointly by civilians and the armed forces. Human food and animal feed represent an estimated one-seventh of the total number of cars in this class: animal and poultry feed alone takes up to nearly 10 percent of the total. Clothing, shoes, medical supplies, various household goods and merchandise compose another one-eighth of the class. At least 10 percent and possibly more is represented by chemicals. Containers, ranging from steel drums and tin cans to empty bottles and bottle caps, account for at least one-eighth of all cars billed in the class.

Strictly military articles aggregated less than 6 percent of the carloads of Class 701, although, as pointed out above, many cars of food, clothing, chemicals and general merchandise, moved under government bills of lading. Strictly military items included here are airplane parts, ordnance, tanks and tank parts, ammunition and others. Some of the ammunition might have been billed as Explosives, NOS (Class 662). In addition, movements of impedimenta by the armed forces are reported in Class 701: thus, guns, tanks and other items involved in impedimenta movements are billed in Class 701. Military trucks are billed in Autotrucks (Class 591). In May, the commodities classed as strictly military (See tabulation below) accounted for 549 cars, or 4.2 percent of Class 701. On the September one-day study these same military items required 1,015 cars, or 7.1 percent of all cars in Class 701. Needless to say, it is expected that the military portion of traffic will increase substantially in 1943 and may well amount to more than 15 percent of the total cars in the class.

It is very difficult because of the number and variety of the components to classify all or even a substantial part of the car waybills reported in this class. An attempt has been made to classify items which accounted for 20 cars or more on either of the days on which studies were condicted by ODT (May 27 and September 28, 1942). These items required 20,019 cars out of a total of 27,403 cars listed in Class 701 on the two days in question, or 73.07 percent of the total movement. The following table lists the more important commodities in 701 and shows the percent of total cars for each commodity reported.

Analysis of Account 701, Manufactures & Miscellaneous, NOS
By Commodities With 20 Cars or More
For May 27 and September 28, 1942

Group & Commodity	% Of Total Cars
Chemicals, Compounds, & Ferro-Alloys	
Acids, noibn	.43
Alcohol	.19
Sulfate of Aluminum	.18
Ammonia, noibn	.38
Anti-Freeze compound	.14
Calcium carbide	.23
Calcium chloride	.31
Caustic soda	.83
Chemicals, noibn	1.53
Coal tar	.58
Coal tar oil	.16
Compounds, noibn	.13
Creosote oil	.37
Ethyl	.17
Wood extracts	.11
Phosphates, noibn	.34
Silicated soda	.22
Soda ash	1.70
Tanning extract	.24
Tar, noibn	.52
Toluol	.29
Carbon dioxide	.14
Carbon, black	.20
Ferro manganese	.30
Ferro silicon	.17
	9.86
Railway & Industrial Equipment	
Auto bodies, S.U.	.26
Railway car bodies	.16
Carbon electrodes	.17
Electric cable	.24
Contractors outfits	.72
Cranes, noibn	.41
Electric transformers	.26
Furnaces & parts	.17
Ingot molds	.62
Locomotives	.12
Warehouse trucks	.16
Wire noibn	.22
Wire robe	.15
Truck bodies, S.U.	.16
Tank cars	.17
	3.99

Group & Commodity	% Of Total Cars
Military	
Airplane parts	.52
MT Cartridge shells	.18
Guns	.36
Military goods, nos	.70
Tank material	.16
Tanks, noibn	.65
Gun mounts	.20
MT projectiles	.86
Projectiles ammunition	.36
Military tanks	.69
Airplane landing mats	.16
Ammunition boxes	.30
Ordnance	.22
Tents	.16
Boats and parts	.18
	5.70
Foods	
Bakery foods, noibn	.85
Candy	.23
Cornstarch	.34
Corn sugar	.36
Veg. oil shortening	.20
Starch	.30
Groceries	.73
Sugar	.38
Syrups	.22
	3.61
Construction Materials	
I & S bolts noibn	.30
I & S concrete reinforcements	.26
Nails noibn	.21
Pipe fitting noibn	.16
S I or S S pipe	.19
Plasterboard	.11
Poles, noibn	.24
Portable houses	.46
Wallboard, noibn	.37
Gypsum plasterboard	1.14
Gypsum wallboard	.15
Asbestos insulating material	.14
Prefabricated houses	.28
I or S bolts	.30
Roofing noibn	.26
	4.57

Group & Commodity	% Of Total Cars
Containers	
Empty barrels, noibn	1.21
Return barrel	.30
Baskets	.15
Bins	.11
Bottle caps	.15
Bottles	.34
Empty boxes	.91
Fiber boxes	1.69
Paper boxes	.58
I & S shipping drums,new	2.57
" " " old	.32
Glassware	.49
Tin cans	3.35
	12.17
Woodpulp & Paper*	
Paper articles	.23
" scrap	2.89
" towels	.25
Toilet paper	.59
Wood pulp	1.82
Paper face tissue	.07
Paper, noibn	.22
	6.07

*Paper boxes have been classified under "Containers"

Group & Commodity	% Of Total Cars
Textiles & Leather Goods	
Blankets	.28
Clothing	.44
Comfortables	.18
Rags	.96
Shoes	.40
	2.26
Miscellaneous Items	
Circus outfits	.11
Rubber scrap	.81
Merchandise, noibn	6.15
	7.07

Group & Commodity	% Of Total Cars
Fertilizers & Waste	
Ashes, noibn	.42
Cinders "	.47
Flue dust "	.25
Foundry refuse	.70
Cinder pyrites	.19
Refuse noibn	.43
Waste "	.58
	3.04
Feed	
Animal or poultry feed, noibn	9.68
Salt cake	.23
	9.91
Household Goods	
Earthenware noibn	.12
Household goods	.23
Iron or steel ware	.19
Linoleum	.27
Matches	.21
Mineral wool	.84
Refrigerators	.31
Stoves and parts	.23
Trunks	.09
	2.49
Non-Ferrous Metals & Metal Scrap	
Aluminum sheet	.28
Copper scales	.10
Copper wire	.30
Scrap metal, noibn	.81
Tinplate scrap	.28
Tin scrap	.18
	1.95
Medical Supplies	
Absorbent cotton	.22
Medical supplies, nos	.16
	.38

Obviously, it would be a tedious process to estimate separately the 1943 tonnage of each item listed above; moreover, such a process would not give an accurate forecast since only 73 percent of the carloads would have been covered.

Fortunately, there is a shorter and, it is believed, a much more reliable method of estimating Class 701. A very close relationship has been found between the figures of revenue tonnage originating of Class 701 and the Federal Reserve Board Index of Manufactures (unadjusted). The degree of relationship is highly significant whether annual or quarterly periods are compared. Since both the Federal Reserve Board Index and shipments of Manufactures and Miscellaneous, NOS, reflect changes in the production of durable and non-durable goods, the relationship is not accidental nor one of cause and effect.

Comparison of the Index of Manufactures and Class 701 for the years 1935-1942 revealed a correlation of .99. A similar coefficient was obtained by comparing quarterly data for 1941-1942. When quarterly data were used, the line of average relationship was found to have the equation: $Y_c = -2.40582 + .12564 X$ (Y_c standing for computed or estimated tons originating and X for the quarterly Index of Manufactures. The resultant answer is in terms of millions of tons. The standard error of estimate is .42 million tons, signifying that 68% of the cases will fall within a range of ± .42 million tons about the line of relationship. That the correlation of the Index of Manufactures with quarterly figures of Class 701 is very high may be seen in the following table.

Comparison of Actual with Estimated Figures of Tonnage Hauled for Item 701, Manufactures and Miscellaneous, NOS by Quarters, 1941 and 1942

	F.R.B.	Tons Originated			Percent
1941	Index	Estimated	Actual	Absolute Difference	Difference From Actual
First Quarter	144	15,800,000	14,944,173	+ 855,827	- 5.7
Second "	159	17,700,000	17,798,920	- 98,920	- .6
Third "	168	18,800,000	19,192,710	- 392,710	- 2.0
Fourth "	173	19,400,000	19,336,985	+ 63,015	+ .3
Total		71,700,000	71,272,788	+ 427,212	+ .6
1942					
First Quarter	180	20,200,000	19,554,691	+ 645,309	+ 3.3
Second "	183	20,600,000	20,913,389	- 313,389	- 1.5
Third "	196	22,200,000	22,169,191	+ 30,809	+ .1
Fourth "	206	23,400,000	23,631,930	- 231,930	- 1.0
Total		86,400,000	86,269,201	+ 130,799	+ 1.5

Estimates of the Index of Manufactures for 1943 have been made by the Department of Commerce and are now being revised. The unrevised forecast of the Index of Manufactures for the year 1943 was 223, as compared with 190 for the year 1942. Using the formula for the annual relationship, it may be estimated that Class I carriers will originate 102.4 million tons of freight in Class 701. On the basis of the forecasts of quarterly levels for the Index of Manufactures, the tonnage originating in Class 701 by quarters may be estimated as follows:

First Quarter	24.2 million tons
Second Quarter	25.6 million tons
Third Quarter	26.1 million tons
Fourth Quarter	26.5 million tons

APPENDIX

TABLE I

NUMBER OF TONS OF REVENUE FREIGHT ORIGINATED BY COMMODITIES FOR THE YEARS 1941, 1942, and 1943 (Estimated)

(Percent Change; 1943 over 1942, and 1942 over 1941)

I.C.C. Number	Commodity Class	1941	1942	1943 Estimated	% Change 1942/1941	% Change 1943/1942
	Group I - Products of Agriculture					
10	Wheat	23,469,756	24,575,804	33,177,000	+ 4.7	+35.0
20	Corn	12,147,597	17,627,890	16,570,000	+45.1	- 6.0
30	Oats	2,848,656	3,473,709	3,995,000	+21.9	+15.0
40	Barley and rye	4,683,641	5,403,598	6,214,000	+15.4	+15.0
41	Rice	819,031	1,064,860	1,139,000	+30.0	+ 7.0
42	Grain, N.O.S.	94,100	117,788	100,000	+25.2	-15.1
50	Flour, wheat	8,708,210	9,257,781	12,034,000	+ 6.3	+30.0
51	Meal, corn	188,441	192,502	230,000	+ 2.2	+19.5
52	Flour meal, edible, N.O.S.	459,172	545,009	600,000	+18.7	+10.1
60	Cereal food preparations, edible, N.O.S.	892,066	980,046	1,078,000	+ 9.9	+10.0
61	Mill products, N.O.S.	8,653,249	11,048,382	12,705,000	+27.7	-15.0
70	Hay & alfalfa	545,847	764,105	900,000	+40.0	+17.8
71	Straw	290,498	316,700	320,000	+ 9.0	+ 1.0
80	Tobacco, leaf	733,284	742,616	730,000	+ 1.3	- 1.7
90	Cotton in bales	3,864,471	4,173,127	4,100,000	+ 8.0	- 1.8
91	Cotton linters, nails, regins	707,107	713,694	642,000	+ 0.9	-10.0
100	Cottonseed	548,425	671,431	638,000	+22.4	- 5.0
101	Cottonseed meal cake	908,374	1,305,752	1,227,000	+43.7	- 6.0
110	Oranges, grapefruit	2,335,607	2,858,851	3,424,000	+22.4	+19.8
111	Lemons, limes, citrous fruits, N.O.S.	332,532	253,410	300,000	-23.8	+18.4
120	Apples, fresh	872,871	931,921	839,000	+ 6.8	-10.0
121	Bananas	820,614	511,864	325,000	-37.6	-36.5
122	Berries, fresh	31,158	51,364	52,000	+64.9	+ 1.2
123	Cantaloupes, Melons N.O.S.	211,597	178,850	157,000	-15.5	-12.2
124	Grapes, fresh	486,326	460,227	414,000	- 5.5	-10.0
125	Peaches, fresh	264,863	271,470	315,000	+ 2.5	+16.0
126	Watermelons	198,243	207,702	200,000	+ 4.8	- 3.7
127	Fruits, fresh, domestic N.O.S.	462,333	495,532	486,000	+ 7.2	- 1.9
128	Fruits, fresh, tropical, N.O.S.	38,012	32,134	32,000	-15.5	- 0.4
130	Potatoes, other than sweet	3,294,600	3,915,312	4,497,000	+18.8	+14.9
140	Cabbage	230,659	327,190	288,000	+41.9	-12.0
141	Onions	370,032	500,688	476,000	+35.3	- 4.9
142	Tomatoes	240,613	319,883	360,000	+32.9	+12.5
143	Vegetables, fresh, N.O.S.	1,687,211	1,858,954	1,766,000	+10.2	- 5.0
150	Beans and peas, dried	1,050,608	1,418,970	1,419,000	+35.1	--

NUMBER OF TONS OF REVENUE FREIGHT ORIGINATED BY COMMODITIES FOR THE YEARS 1941, 1942, and 1943 (Estimated)

(Percent Change; 1943 over 1942, and 1942 over 1941)-cont'd-

I.C.C. Number	Commodity Class	1941	1942	1943 Estimated	% Change 1942 / 1941	% Change 1943 / 1942
Group I - Products of Agriculture Cont'd						
151	Fruits, dried & evaporated	569,365	617,918	660,000	+ 8.5	+ 6.8
152	Vegetables, dry, N.O.S.	115,227	187,077	282,000	+62.4	+50.7
160	Vegetable oil cake & meal except cottonseed	1,795,230	2,075,152	3,113,000	+15.6	+50.0
161	Peanuts	233,980	350,641	525,000	+49.9	+49.7
162	Flaxseed	799,201	1,027,088	995,000	+28.5	- 3.1
163	Sugarbeets	6,195,766	6,531,000	4,572,000	+ 5.4	-30.0
164	Products of Agriculture, N.O.S.	6,974,092	8,958,309	9,770,000	+28.5	+ 9.1
800	Total products of Agriculture	100,172,666	117,316,390	131,666,000	+17.1	+12.2

NUMBER OF TONS OF REVENUE FREIGHT ORIGINATED BY COMMODITIES FOR THE YEARS 1941, 1942, and 1943 (Estimated)

(Percent Change; 1943 over 1942, and 1942 over 1941)

I.C.C. Number	Commodity Class	1941	1942	1943 Estimated	% Change 1942 / 1941	% Change 1943 / 1942
Group II - Animals and Products						
170	Horses, mules, ponies, & asses	128,540	143,356	143,000	+11.5	--
180	Cattle & Calves, single-deck	3,442,845	4,407,239	5,003,000	+28.0	+13.5
181	Calves, double-deck	86,189	77,652	85,000	- 9.9	+ 9.5
190	Sheep & goats, single-deck	139,854	142,194	127,000	+ 1.7	-10.7
191	Sheep & goats, double-deck	807,473	944,353	906,000	+16.9	- 4.1
200	Hogs, single-deck	549,128	557,331	600,000	+ 1.5	+ 7.7
201	Hogs, double-deck	1,505,420	1,857,200	2,346,000	+23.4	+26.3
210	Fresh meats, N.O.S.	3,407,018	3,841,953	4,226,000	+12.7	+10.0
220	Meats, cured, dried or smoked	758,571	1,536,828	1,780,000	+100.3	+15.8
221	Butterine & Margarine	27,959	65,140	117,000	+133.0	+79.6
222	Packing-house products, edible, N.O.S., not including canned meats	903,949	1,024,216	1,147,000	+13.3	+12.0
230	Poultry, live	17,503	21,291	30,000	+21.6	+40.9
231	Poultry, dressed	266,431	349,291	540,000	+31.1	+54.6
240	Eggs	391,976	398,386	518,000	+ 1.6	+30.0
250	Butter	489,628	500,639	471,000	+ 2.2	- 5.9
251	Cheese	294,716	516,078	455,000	+75.1	-11.8
260	Wool	552,467	877,110	798,000	+58.8	-9.0
270	Hides, green	854,264	859,252	850,000	+ 0.6	- 1.0
271	Leather	176,656	210,759	190,000	+19.3	- 9.8
280	Fish or sea-animal oil	215,634	179,005	143,000	-17.0	-20.2
281	Animals, live, N.O.S.	1,913	5,656	12,000	+195.7	+112.1
282	Animal products, N. O. S.	1,792,015	2,104,633	2,147,000	+17.4	+ 2.0
810	Total Animals & Products	16,810,149	20,619,562	22,634,000	+22.7	+ 9.8

NUMBER OF TONS OF REVENUE FREIGHT ORIGINATED BY COMMODITIES FOR THE YEARS 1941, 1942, and 1943 (estimated)

(Percent Change; 1943 over 1942, and 1942 over 1941)

I.C.C. Number	Commodity Class	1941	1942	1943 Estimated	% Change 1942/1941	% Change 1943/1942
Group IV - Products of Forests						
400	Logs	16,827,051	18,545,050	16,690,000	+10.2	-10.0
401	Posts, poles, and piling	3,395,008	3,297,827	2,638,000	- 2.9	-20.0
402	Wood (fuel)	942,073	1,001,492	901,000	+ 6.3	-10.0
410	Ties, railroad	2,371,691	3,458,667	2,767,000	+45.8	-20.0
420	Pulpwood	14,353,848	17,880,909	15,019,000	+24.6	-16.0
430	Lumber, shingles, and lath	26,022,781	32,523,812	27,645,000	+25.0	-15.0
431	Box, crate, and cooperage materials	2,565,508	2,719,035	2,719,000	+ 6.0	+ 0.0
432	Veneer and built-up wood	964,151	1,073,577	1,127,000	+11.3	+ 5.0
440	Rosin	406,025	438,299	425,000	+ 7.9	- 3.0
441	Turpentine	88,370	82,544	81,000	- 6.6	- 1.9
442	Crude rubber (not reclaimed)	970,784	537,995	414,000	-44.6	-23.0
443	Products of forests, N. O. S.	2,632,649	3,011,235	2,890,000	+14.4	- 4.0
830	Total products of forests	71,539,939	84,570,442	73,316,000	+18.2	-13.3

NUMBER OF TONS OF REVENUE FREIGHT ORIGINATED BY COMMODITIES
FOR THE YEARS 1941, 1942, and 1943 (Estimated)
(Percent Change; 1943 over 1942, and 1942 over 1941)

I.C.C. Number	Commodity Class	1941	1942	1943 Estimated	% Change 1942 / 1941	% Chang 1943 / 1942
Group III - Products of Mines						
290	Anthracite coal	64,340,497	69,350,352	75,600,000	+ 7.8	+ 9.0
300	Bituminous coal	335,195,420	379,309,494	404,450,000	+13.2	+ 6.6
310	Coke	19,980,380	22,411,748	24,430,000	+12.2	+ 9.0
320	Iron ore	100,129,663	112,031,780	116,500,000	+11.9	+ 4.0
330	Copper ore and concentrates	1,644,541	1,562,406	1,656,000	- 5.0	+ 6.0
331	Lead ore and concentrates	617,729	673,167	626,000	+ 9.0	- 7.0
332	Zinc ore and concentrates	2,495,163	3,129,492	3,442,000	+25.4	+10.0
333	Ores and concentrates, N.O.S.	6,682,896	7,412,746	9,637,000	+10.9	+30.0
350	Gravel and sand (other than glass or molding)	49,853,115	76,097,615	51,746,000	+52.6	-30.0
351	Stone, broken, ground or crushed	25,379,518	38,495,804	25,000,000	+51.7	-35.1
352	Stone, rough, N.O.S.	3,718,013	2,963,785	1,778,000	-20.3	-40.0
353	Stone, finished, N.O.S.	216,708	212,153	170,000	- 2.1	-20.0
360	Petroleum, crude	7,317,674	21,179,792	25,416,000	+189.4	+20.0
370	Asphalt (natural or petroleum	6,652,273	5,860,945	4,982,000	-11.9	-15.0
380	Salt	3,439,839	3,800,564	4,370,000	+10.5	+15.0
390	Phosphate rock, crude (ground or not ground)	6,749,025	6,308,852	6,120,000	- 6.5	- 3.0
391	Sulphur (brimstone)	3,454,099	3,120,125	3,120,000	- 9.7	0.0
392	Products of mines, N. O. S.	46,567,087	50,656,312	53,676,000	+ 8.8	+ 6.0
820	Total products of mines	684,433,639	804,577,132	812,719,000	+17.6	+ 1.0

NUMBER OF TONS OF REVENUE FREIGHT ORIGINATED BY COMMODITIES FOR THE YEARS 1941, 1942, and 1943 (Estimated)

(Percent Change; 1943 over 1942, and 1942 over 1941)

I. C. C. Number	Commodity Class	1941	1942	1943 Estimated	% Change 1942 1941	% Chang 1943 1942
Group V - Manufactures & Miscellaneous						
450	Petroleum oils, refined, & all other gasoline	36,217,258	30,443,361	28,921,000	-15.9	- 5.0
451	Fuel, road & petroleum residual oils, N.O.S.	14,573,477	19,290,092	23,148,000	+32.4	+20.0
452	Lubricating oils & greases	4,179,442	4,642,176	5,106,000	+11.1	+10.0
453	Petroleum products, N.O.S.	383,560	401,771	402,000	+ 4.7	+ .1
460	Cottonseed oil	916,951	870,442	870,000	- 5.1	--
461	Linseed oil	316,748	355,354	323,000	+ 12.2	- 9.1
462	Vegetable oils, N.O.S.	869,427	662,643	1,093,000	-23.8	+64.9
470	Sugar (beet or cane)	5,180,900	5,372,916	5,500,000	+ 3.7	+ 2.4
471	Table sirups & edible molasses	801,339	1,275,593	1,212,000	+59.2	- 5.0
472	Molasses, blackstrap & beet residual	1,205,294	849,790	425,000	-29.5	-50.0
490	Iron, pig	7,691,984	7,507,416	7,250,000	- 2.4	- 3.4
491	Iron & steel - 6th Class, N.O.S.	10,572,542	12,193,889	12,560,000	+15.3	+ 3.0
500	Rails, fastenings, frogs, & switches	2,365,852	2,913,216	2,913,000	+23.1	--
510	Cast iron pipe & fittings	1,322,370	1,348,077	1,146,000	+ 1.9	-15.0
511	Iron & steel pipe fittings, N.O.S.	6,045,834	5,326,712	4,793,000	-11.9	-10.0
512	Iron & steel: Nails & wire, not woven	2,363,816	2,357,974	2,004,000	- .3	-15.0
513	Iron & steel-5th class, N.O.S. (tin and terneplate)	41,440,836	45,502,801	47,780,000	+9.8	+ 5.0
520	Copper: Ingot, matte, & pig	1,295,487	1,453,743	1,454,000	+12.2	0
521	Copper, brass & bronze: Bar, sheet, pipe	711,467	891,950	1,026,000	+25.4	+15.0
522	Lead & zinc: Ingot, pig, or bar	1,819,951	1,790,648	1,898,000	- 1.6	+ 6.0
523	Aluminum: Ingot, pig, or slab	194,051	347,433	625,000	+78.9	+79.0
530	Machinery & boilers	3,190,102	4,357,478	4,794,000	+36.6	+10.0

NUMBER OF TONS OF REVENUE FREIGHT ORIGINATED BY COMMODITIES
FOR THE YEARS 1941, 1942, and 1943 (Estimated) Cont'd
(Percent Change; 1943 over 1942, and 1942 over 1941)

I.C.C. Number	Commodity Class	1941	1942	1943 Estimated	% Change 1942 / 1941	% Change 1943 / 1942
Group V - Manufactures & Miscellaneous Cont'd						
540	Cement, natural or Portland (bldg)	24,417,563	28,058,744	19,640,000	+14.9	-30.0
550	Brick; common	1,927,939	1,820,409	1,277,000	- 5.6	-30.0
551	Brick; N.O.S., & building tile	6,337,261	6,670,497	6,270,000	+ 5.3	- 6.0
552	Artificial stone, N.O.S.	284,900	326,600	278,000	+14.6	-14.9
560	Lime, common (quick or slaked)	3,277,995	3,179,938	3,053,000	- 3.0	- 4.0
561	Plaster (stucco or wall) and dry kalsomine	1,307,532	893,742	580,000	-31.6	-35.1
570	Sewer pipe & drain tile (not metal)	983,603	1,110,899	722,000	+12.9	-35.0
580	Agricultural implements & parts, N.O.S.	906,719	640,872	428,000	-29.4	-33.2
581	Vehicles, horse-drawn & parts, N.O.S.	25,382	45,828	34,000	+80.5	+25.8
582	Tractors & parts	771,068	908,170	886,000	+17.8	- 2.4
583	Railway car wheels, axles, & trucks	562,546	546,023	513,000	- 2.9	- 6.1
590	Automobiles (passenger)	2,334,268	329,662	160,000	+41.2	-51.5
591	Auto trucks	809,051	1,888,094	2,750,000	+133.4	+45.6
592	Automobiles, auto-trucks, K.D. & parts, N.O.S.	5,732,959	3,579,910	4,000,000	-37.6	+11.7
593	Automobile & Auto-truck tires	711,496	495,369	500,000	-30.4	+ 1.0
610	Furniture, metal	374,124	395,897	140,000	+ 5.8	-64.6
611	Furniture, other than metal	673,328	862,054	600,000	+28.0	-30.4
620	Beverages	3,323,394	4,716,893	5,190,000	+41.9	+10.0
630	Ice	725,393	852,357	895,000	+17.5	+ 5.0
640	Fertilizers, N.O.S.	11,736,528	13,445,321	14,520,000	+14.6	+ 8.0
650	Newsprint paper	1,301,583	1,406,516	1,266,000	+ 8.1	-10.0
651	Printing paper, N.O.S.	2,308,876	2,249,846	2,205,000	- 2.6	- 2.0
660	Alcohol, denatured or wood	572,757	680,723	953,000	+18.9	+40.0
661	Sulphuric acid	2,848,807	4,632,463	6,670,000	+62.6	+44.0
662	Explosives, N.O.S.	837,388	5,337,381	10,670,000	+537.4	+100.0
670	Cotton cloth & cotton fabrics, N.O.S.	553,806	1,003,267	1,254,000	+ 81.2	+25.0

NUMBER OF TONS OF REVENUE FREIGHT ORIGINATED BY COMMODITIES FOR THE YEARS 1941, 1942, and 1943 (Estimated) (Cont'd)

(Percent Change; 1943 over 1942, and 1942 over 1941)

I.C.C. Number	Commodity Class	1941	1942	1943 Estimated	% Change 1942 / 1941	% Chang 194 / 194
Group V - Manufactures & Miscellaneous (Cont'd)						
671	Bagging & bags, burlap gunny or jute	279,482	370,313	444,000	+32.5	+20.0
680	Canned food products. N.O.S.	7,066,627	9,904,258	9,510,000	+40.2	- 4.0
690	Tobacco, manufactured products	303,967	335,485	376,000	+10.4	+12.1
691	Paints in oil and varnishes	370,885	421,082	316,000	+13.5	-25.0
692	Furnace slag	8,471,781	9,968,756	8,000,000	+17.7	-20.0
693	Scrap iron and scrap steel	16,269,380	18,627,513	18,628,000	+14.5	+ 0.0
694	Paper bags & wrapping paper	2,025,874	2,102,827	1,950,000	+ 3.8	- 7.3
695	Paperboard, pulpboard, wallboard	3,977,764	3,969,583	4,525,000	- 0.2	+14.0
696	Bldg. paper and prepared roofing materials	2,071,541	2,545,757	2,164,000	+22.9	-15.0
697	Building woodwork (millwork)	617,892	561,206	393,000	- 9.2	-30.0
698	Soap & washing compounds	1,341,499	1,400,249	1,400,000	+ 4.4	0.0
699	Glass, flat, other than plate	570,602	455,339	319,000	-20.0	-29.9
700	Glass: Bottles, jars, and jelly glasses	2,661,621	3,364,000	4,373,000	+26.4	+30.0
701	Manufactures & miscellaneous, N.O.S.	71,269,171	86,269,010	102,400,000	+21.0	+18.7
840	Total Manufactures & Miscellaneous	336,603,030	376,528,328	395,495,000	+11.9	+ 5.0
850	Grand Total, Carload Traffic	1,209,559,423	1,403,611,854	1,435,830,000	+16.0	+ 2.3

TABLE II

REVENUE TONS ORIGINATED BY QUARTERS, 1943

(For 91 major classes representing 98.2 percent of freight)

Class No.	Commodity	Total 1943 tonnage	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
300	Bitum. coal	404,450,000	101,000,000	100,000,000	102,000,000	101,450,000
320	Iron ore	116,500,000	4,000,000	34,000,000	50,750,000	27,750,000
701	Mfrs & misc.	102,400,000	24,200,000	25,600,000	26,100,000	26,500,000
290	Anthracite coal	75,600,000	18,200,000	19,400,000	20,000,000	18,000,000
350	Sand & gravel	51,746,000	14,000,000	16,200,000	12,200,000	9,346,000
392	Mine products, nos	53,676,000	11,500,000	14,000,000	15,000,000	13,176,000
351	Crushed stone	25,000,000	5,700,000	7,600,000	6,400,000	5,300,000
513	I & S 5th cl.	47,780,000	11,400,000	12,100,000	12,000,000	12,280,000
360	Crude oil	25,416,000	6,200,000	6,700,000	6,300,000	6,216,000
450	Pet. oil refined	28,921,000	6,300,000	6,700,000	7,800,000	8,121,000
451	Fuel & rd. oil	23,148,000	5,800,000	5,700,000	5,600,000	6,048,000
540	Cement	19,640,000	5,600,000	6,200,000	4,500,000	3,340,000
430	Lumber	27,645,000	6,200,000	7,200,000	7,200,000	7,045,000
10	Wheat	33,170,000	6,900,000	7,300,000	11,000,000	7,977,000
310	Coke	24,430,000	5,950,000	6,050,000	6,150,000	6,280,000
20	Corn	16,570,000	4,500,000	4,100,000	3,800,000	4,170,000
400	Logs	16,690,000	3,600,000	4,400,000	4,600,000	4,090,000
693	Scrap I & S	18,628,000	4,700,000	4,650,000	4,650,000	4,628,000
420	Pulpwood	15,019,000	4,300,000	3,900,000	3,600,000	3,219,000
640	Fertilizers	14,520,000	3,800,000	4,200,000	3,200,000	3,320,000
491	I & S, 6th cl.	12,560,000	3,100,000	3,150,000	3,300,000	3,010,000
662	Explosives	10,670,000	2,300,000	2,600,000	2,850,000	2,920,000
61	Mill products, nos	12,750,000	3,095,000	3,150,000	3,205,000	3,300,000
50	Wheat flour	12,034,000	2,700,000	2,850,000	3,050,000	3,434,000
692	Furnace slag	8,000,000	2,300,000	2,300,000	1,800,000	1,600,000
490	Pig iron	7,250,000	1,800,000	1,800,000	1,850,000	1,800,000
164	Ag. prod. nos	9,770,000	2,100,000	1,800,000	1,850,000	4,020,000
680	Canned foods	9,510,000	2,600,000	1,900,000	2,500,000	2,510,000
390	Phosp. rock	6,120,000	1,400,000	1,475,000	1,600,000	1,645,000
370	Asphalt	4,932,000	1,000,000	1,500,000	1,300,000	1,182,000
551	Brick & tile	6,270,000	1,550,000	1,650,000	1,600,000	1,470,000
163	Sugar beets	4,572,000	100,000	60,000	300,000	4,112,000
511	I & S. pipe	4,793,000	1,300,000	1,300,000	1,100,000	1,093,000
470	Sugar	5,500,000	1,350,000	1,400,000	1,400,000	1,350,000
40	Barley & rye	6,214,000	1,400,000	1,200,000	1,850,000	1,764,000
452	Lube oil & gr.	5,106,000	1,200,000	1,300,000	1,300,000	1,306,000
695	Paperboard	4,525,000	1,200,000	1,200,000	1,100,000	1,025,000
90	Cotton bales	4,100,000	1,100,000	850,000	800,000	1,350,000
352	Rough stone, nos	1,778,000	600,000	500,000	400,000	278,000
391	Sulfur	3,120,000	720,000	1,000,000	750,000	650,000
180	Cattle	5,003,000	700,000	950,000	1,300,000	2,053,000
380	Salt	4,370,000	1,100,000	1,070,000	1,100,000	1,100,000
210	Fresh meat	4,226,000	950,000	1,000,000	1,100,000	1,176,000
401	Posts & poles	2,638,000	650,000	688,000	650,000	650,000
60	Cereal foods	1,078,000	270,000	270,000	270,000	268,000

620	Beverages	5,190,000	1,200,000	1,300,000	1,400,000	1,290,000
130	Potatoes	4,497,000	1,350,000	1,100,000	750,000	1,297,000
560	Lime	3,053,000	700,000	800,000	800,000	753,000
530	Machinery & boilers	4,794,000	1,150,000	1,250,000	1,200,000	1,194,000
661	Sulfuric acid	6,670,000	1,550,000	1,650,000	1,720,000	1,750,000
30	Oats	3,995,000	995,000	700,000	1,200,000	1,100,000
110	Citrus fruit	3,424,000	1,100,000	1,050,000	500,000	774,000
160	Veg.oils, cake & meal	3,113,000	700,000	600,000	800,000	1,013,000
201	Hogs, dd	2,346,000	600,000	550,000	450,000	746,000
220	Cured meat	1,780,000	400,000	450,000	450,000	480,000
282	Animal prod.nos	2,147,000	520,000	530,000	550,000	547,000
332	Zinc ore	3,442,000	800,000	850,000	900,000	892,000
333	Ores, nos	9,637,000	2,000,000	2,300,000	2,600,000	2,737,000
410	Rail ties	2,767,000	640,000	850,000	850,000	427,000
431	Boxes & crates	2,719,000	650,000	650,000	700,000	719,000
443	Forest prod.,nos	2,890,000	650,000	750,000	750,000	740,000
500	Rails	2,913,000	750,000	800,000	750,000	613,000
512	Nails & wire	2,004,000	500,000	500,000	504,000	500,000
522	Lead & zinc	1,898,000	440,000	500,000	485,000	473,000
550	Brick	1,277,000	300,000	400,000	300,000	277,000
591	Auto trucks	2,750,000	600,000	650,000	725,000	775,000
592	Auto parts	4,000,000	950,000	1,000,000	1,025,000	1,025,000
41	Rice	1,139,000	450,000	125,000	100,000	464,000
650	Newsprint paper	1,266,000	300,000	325,000	325,000	316,000
651	Printing paper, nos	2,205,000	600,000	660,000	520,000	425,000
670	Cotton cloth	1,254,000	325,000	325,000	325,000	279,000
694	Paper bags	1,950,000	500,000	500,000	475,000	475,000
696	Bldg. paper	2,164,000	600,000	650,000	500,000	414,000
698	Soap	1,400,000	350,000	350,000	350,000	350,000
700	Glass bottles	4,373,000	920,000	1,050,000	1,150,000	1,253,000
101	Cottonseed meal & cake	1,227,000	450,000	150,000	200,000	427,000
143	Veg. fresh, nos	1,766,000	550,000	500,000	300,000	416,000
650	Dried beans & peas	1,419,000	400,000	200,000	219,000	600,000
222	Packing house prod.	1,147,000	250,000	250,000	300,000	347,000
330	Copper ore	1,656,000	420,000	420,000	410,000	406,000
402	Fuelwood	901,000	250,000	200,000	200,000	251,000
432	Veneer	1,127,000	260,000	280,000	300,000	287,000
471	Syrup & molasses	1,212,000	300,000	300,000	300,000	312,000
520	Copper, ingot & pig	1,454,000	380,000	380,000	360,000	334,000
510	Cast iron pipe	1,146,000	300,000	300,000	280,000	266,000
521	Copper, brass & bronze	1,026,000	250,000	250,000	260,000	266,000
462	Veg. oils, nos	1,093,000	200,000	250,000	250,000	393,000
162	Flaxseed	995,000	200,000	100,000	450,000	245,000
20	Hay & alfalfa	900,000	250,000	150,000	200,000	300,000
120	Apples	839,000	280,000	150,000	70,000	339,000
191	Sheep & goats	906,000	200,000	200,000	200,000	306,000
	Total 91 classes	1,409,766,000	317,965,000	360,258,000	378,628,000	35,291,500

TABLE III

COMMODITY GROUPS SELECTED IN STUDY OF FEDERAL COORDINATOR

1. Bulk Grain and Sugar Beets:

   Wheat; corn; oats; barley and rye; flaxseed; sugar beets. (Class 10-40; 162-3)

2. Other Cereals:

   Rice; grain, nos; flour, wheat; meal, corn; flour and meal, edible, nos; cereal, food preparations, nos; mill products, nos. (Classes 41-61)

3. Cotton, Hay, and Tobacco:

   Hay and alfalfa; straw; tobacco; cotton in bales; cotton linters, etc. (Classes 70-91).

4. Perishables:

   Oranges and grapefruit; citrus fruits, nos; apples; bananas; berries; melons; grapes; peaches; watermelons; fruit, fresh, domestic, nos; fruit, fresh, tropical, nos; potatoes; cabbage; onions; tomatoes; vegetables, fresh. (Classes 110-143)

5. Live Animals:

   Horses; cattle; calves; sheep and goats, s.d.; sheep and goats, d.d.; hogs, s.d.; hogs, d.d.; poultry, live; wool; hides, green; animals, live, nos. (Classes 170-201; 230; 260; 270; 281)

6. Animal Products, Edible:

   Fresh meats; cured meats; margarine; packinghouse products; poultry, dressed; eggs; butter; cheese. (Classes 210-222; 231; 240-251)

7. Miscellaneous Farm Products:

   Beans and peas; fruits, dry; vegetables, dry; peanuts; products of agriculture, nos; animal products, nos; fertilizers, nos. (Classes 150-164; 282; 640)

8. Coal and Coke:

   Anthracite coal; bituminous coal; coke. (Classes 290-310)

9. Ores:

   Iron ore; copper ore; lead ore; zinc ore; ores, etc.; mine products, nos. (Classes 320-333; 392)

10. Sand, Stone, and Gravel:

Sand and gravel; stone, broken, etc.; stone, rough; stone, finished. (Classes 350-3)

11. Sulfur and Sulfuric Acid:

Phosphate rock; sulfur; sulfuric acid. (Classes 390-1; 661)

12. Oils - Vegetable and Animal:

Cottonseed; cottonseed meal and cake; vegetable oil cake and meal except cottonseed; cottonseed oil; linseed oil; vegetable oils, nos; fish or sea animal oil. (Classes 100-1; 160; 460-2; 280)

13. Iron and Steel:

Iron, pig; iron and steel, nos; rails, fastenings, frogs, switches; cast iron pipe or fitting; iron and steel pipe or fittings, nos; iron and steel: nails and wire, not woven; iron and steel, rated 5th class, nos; railway car wheels, axles and trucks; furnace slag; scrap iron and scrap steel. (Classes 490-513; 583; 692-3)

14. All Other Metals:

Copper: ingot, matte, and pig; copper, brass and bronze: bar, sheet, and pipe; lead and zinc: ingot, pig and bar; aluminum: ingot, pig, and slab. (Classes 520-3)

15. Petroleum and Products:

Petroleum, crude; asphalt; petroleum oils, refined, etc.; fuel, road and petroleum, nos; lubricating oils and greases; petroleum products, nos. (Classes 360, 370; 450-3)

16. Forest Products:

Logs; posts, poles and piling; wood (fuel); ties, railroad; pulpwood; lumber, shingles, and lath; box, crate, and cooperage materials; veneer and built-up wood; crude rubber; products of forests, nos. (Classes 400-432; 442-3)

17. Appliances:

Machinery and boilers; agricultural implements or parts, nos; vehicles, horse-drawn, or parts, nos; tractors and parts; automobiles, (passenger); auto trucks; automobiles and autotrucks and parts, nos; automobiles and autotruck tires; furniture, metal; furniture, other than metal; building woodwork. (Classes 530; 580-593; 610-1; 697)

18. Building Material:

Cement, natural or Portland; brick, common; brick, nos, and building tile; artificial stone, nos; lime, common (quick or slaked); plaster (stucco or wall) and dry kalsomine. (Classes 540-561)

19. Manufactured Food:

Salt, sugar (beet or cane); table sirups and edible molasses; molasses, blackstrap, and beet residual; beverages; ice; canned food products. (Classes 380; 470-2; 620; 630; 680)

20. Paper and Products:

Newsprint paper; printing paper, nos; paper bags and wrapping paper; paperboard, pulpboard, and wallpaper; building paper and prepared roofing material. (Classes 650-1; 694-6)

21. Chemicals:

Rosin; turpentine; alcohol, denatured or wood; explosives, nos; paints in oil and varnishes. (Classes 440-1; 660; 662; 691)

22. Textile and Leather:

Leather; cotton cloth and cotton fabrics; bagging and bags, etc. (Classes 271; 670-1)

23. Glass and Tile:

Sewer pipe and draintile; glass, flat, other than plate; glass: bottles, jars, and jelly glasses. (Classes 570; 699; 700)

24. Miscellaneous:

Tobacco, manufactured products; soap and washing compounds; manufactures and miscellaneous, nos. (Classes 690; 698; 701)

TABLE IV

ESTIMATED TONS ORIGINATED, BY COMMODITY GROUPS, TYPE OF FREIGHT CAR, AND RELATIVE IMPORTANCE OF TYPE OF FREIGHT CAR TO THE TOTAL OF EACH COMMODITY GROUP

Years 1941, 1942 and 1943) (Thousand Tons)

	Grand total --						Products of Agriculture					
Type of Car	1943	%	1942	%	1941	%	1943	%	1942	%	1941	%
Box	423,358	29.5	406,827	29.0	350,372	29.0	112,597	85.5	97,325	82.9	82,019	81.9
Hopper (OT)	551,702	38.5	531,330	37.9	467,413	38.6	678	.5	767	.6	681	.7
Hopper (CT)	9,176	.6	10,438	.7	9,422	.8	---	---	---	---	---	---
Gondola	285,207	19.9	301,663	21.5	254,287	21.0	4,137	3.1	5,812	5.0	5,491	5.4
Flat	29,194	2.0	28,324	2.0	25,072	2.1	84	.1	115	.1	108	.1
Refrigerator	30,088	2.1	28,285	2.0	23,675	2.0	13,882	10.5	13,028	11.1	11,659	11.6
Stock	10,073	.7	9,017	7.6	7,427	.6	77	.1	72	.1	61	.1
Tank	96,481	6.7	87,172	6.2	71,441	5.9	78	.1	72	.1	56	.1
Other	552	(1)	557	(1)	450	(1)	132	.1	126	.1	99	.1
Grand Total by Commodity Groups	1,435,831	100.0	1,403,613	100.0	1,209,559	100.0	131,665	100.0	117,317	100.0	100,174	100.0

(1) Less than .05

ESTIMATED TONS ORIGINATED, BY COMMODITY GROUPS, TYPE OF FREIGHT CAR, AND RELATIVE IMPORTANCE OF TYPE OF FREIGHT CAR TO THE TOTAL OF EACH COMMODITY GROUP (CONT'D)

(Years 1941, 1942, and 1943)
(Thousand tons)

Type of Car	Products of forests 1943	%	1942	%	1941	%	Manufacturers 1943	%	1942	%	Miscellaneous 1941	%
Box	42,359	57.8	48,927	57.9	40,583	56.7	198,053	50.1	192,494	51.1	166,874	49.5
Hopper (OT)	1,243	1.7	1,465	1.7	1,211	1.7	12,233	3.1	13,246	3.5	11,402	3.4
Hopper (CT)	6	(1)	7	(1)	5	(1)	4,599	1.2	5,971	1.6	5,289	1.6
Gondola	11,755	16.0	13,590	16.1	11,710	16.4	96,400	24.4	90,245	24.0	83,410	24.8
Flats	17,424	23.8	19,980	23.6	17,519	24.5	10,795	2.7	7,019	1.9	6,432	1.9
Refrigerator	23	(1)	24	(1)	21	(1)	7,600	1.9	7,540	2.0	5,632	1.7
Stock	327	.4	385	.4	315	.4	37	(1)	31	(1)	21	(1)
Tank	128	.2	131	.2	128	.2	65,706	16.6	59,923	15.9	57, 501	17.1
Other	52	.1	62	.1	49	.1	72	(1)	59	(1)	43	(1)
Grand Total By Commodity Groups	73,317	100.0	84,571	100.0	71,541	100.0	395,495	100.0	376,528	100.0	336,604	100.0

(1) Less than .05

ESTIMATED TONS ORIGINATED BY COMMODITY GROUPS, TYPE OF FREIGHT CAR, AND RELATIVE IMPORTANCE OF TYPE OF FREIGHT CAR TO THE TOTAL OF EACH COMMODITY GROUP (CONT'D)

YEARS 1941, 1942, and 1943)

(Thousand tons)

Type of Car	Animal and Animal Products						Products of Mines					
	1943	%	1942	%	1941	%	1943	%	1942	%	1941	%
Box	4,012	17.7	3,968	19.2	3,044	18.1	66,336	8.2	64,114	8.0	57,852	8.5
Hopper (OT)	19	.1	19	.1	16	.1	537,528	66.1	515,833	64.1	454,104	66.3
Hopper (CT)	--	--	--	--	--	--	4,571	.6	4,461	.6	4,128	.6
Gondola	317	1.4	300	1.5	249	1.5	172,598	21.2	191,716	23.8	153,427	22.5
Flat	5	(1)	5	(1)	4	(1)	886	.1	1,205	.1	1,010	.1
Refrigerator	8,555	37.8	7,669	37.2	6,342	37.7	28	(1)	24	(1)	22	(1)
Stock	9,037	40.0	7,971	38.7	6,535	38.9	594	.1	557	.1	494	.1
Tank	688	3.0	688	3.3	619	3.7	29,881	3.7	26,358	3.3	13,138	1.9
Other	--	--	--	--	--	--	296	(1)	309	(1)	259	(1)
Grand Total by Commodity Groups	22,633	100.0	20,620	100.0	16,809	100.0	812,718	100.0	804,577	100.0	684,434	100.0

(1) Less than .05

TABLE V
USE OF EQUIPMENT BY COMMODITY GROUPS AND CLASSES *

	Commodity group or class (1)	Assignment to equipment	
		Percent (2)	Class Of Car (3)
GROUP I.	Products of Agriculture		
	10 Wheat	99.55	Box
		.31	Hopper (O.T.)
		.09	Gondola
		.05	Other
	20 Corn	98.92	Box
		.62	Hopper (O.T.)
		.08	Gondola
		.38	Other
	30 Oats	98.01	Box
		1.74	Hopper (O.T.)
		.25	Other
	40 Barley & Rye	99.24	Box
		.38	Hopper (O.T.)
		.19	Gondola
		.19	Other
	41 Rice	100.00	Box
	42 Grain, NOS	100.00	Box
	50 Flour, wheat	99.91	Box
		.09	Other
	51 Meal, corn	100.00	Box
	52 Flour & Meal edible	100.00	Box
	60 Cereal Food preparations Edible, NOS	99.17	Box
		.83	Ref.
	61 Mill products, NOS	99.17	Box
		.43	Hopper (O.T.)
		.43	Ref.
	70 Hay & Alfalfa	98.56	Box
		1.44	Stock
	71 Straw	100.00	Box
	80 Tobacco, leaf	98.83	Box
		.78	Hopper (O.T.)
		.39	Stock
	90 Cotton in bales	99.50	Box
		.10	Gondola
		.10	Flat
		.10	Stock
		.20	Other

Commodity group or class (1)		Assignment to equipment Percent (2)	Class Of Car (3)
91	Cotton linters, noils and regins	99.32 .68	Box Other
100	Cottonseed	100.00	Box
101	Cottonseed, meal and cake	100.00	Box
110	Oranges and Grapefruit	2.80 97.20	Box Ref.
111	Lemons, limes, and citrus fruits NOS	9.76 90.24	Box Ref.
120	Apples, fresh	4.68 95.32	Box Ref.
121	Bananas	100.00	Ref.
122	Berries	100.00	Ref.
123	Cantaloups and melons, NOS.	100.00	Ref.
124	Grapes, fresh	1.32 2.64 96.04	Box Stock Ref.
125	Peaches, fresh	15.38 84.62	Box Ref.
126	Watermelons	58.30 41.70	Box Ref.
127	Fruits, fresh, domestic, NOS	2.90 .48 96.62	Box Stock Ref.
128	Fruits, fresh tropical, NOS	50.00 50.00	Box Ref.
130	Potatoes, other than sweet	2.13 .18 .36 97.33	Box Hopper (O.T.) Stock Ref.
140	Cabbage	100.00	Ref.
141	Onions	1.60 98.40	Box Ref.
142	Tomatoes	3.00 7.00 90.00	Box Stock Ref.

Commodity group or class	Assignment to equipment	
(1)	Percent (2)	Class Of Car (3)
143 Vegetables, fresh, NOS	2.24	Box
	.15	Hopper (O.T.)
	.80	Gondola
	.15	Stock
	96.66	Ref.
150 Beans and peas, dried	96.60	Box
	.40	Ref.
151 Fruits, dried or evaporated	90.48	Box
	9.52	Ref.
152 Vegetables, dry NOS	3.25	Box
	96.75	Ref.
160 Vegetable-oil cake and meal, except cottonseed	99.75	Box
	.25	Ref.
161 Peanuts	89.97	Box
	10.03	Ref.
162 Flaxseed	100.00	Box
163 Sugar beets	5.40	Box
	6.60	Hopper (O.T.)
	86.40	Gondola
	1.60	Flat
164 Products of Agriculture, NOS	96.94	Box
	.07	Hopper (O.T.)
	1.16	Gondola
	.07	Flat
	.89	Ref.
	.80	Tank
	.07	Other
810 Total Products of Agriculture		Box
		Hopper (O.T.)
		Gondola
		Flat
		Stock
		Ref.
		Tank
		Other
GROUP II. Animals and Products		
170 Horses, mules, ponies, and asses	1.35	Box
	98.65	Stock
180 Cattle and calves, single deck	1.64	Box
	2.15	Gondola
	96.21	Stock

Commodity group or class (1)	Assignment to equipment	
	Percent (2)	Class Of Car (3)
181 Calves, double-deck	100.00	Stock
190 Sheep and goats, single-deck	100.00	Stock
191 Sheep and goats, double-deck	.50	Box
	99.50	Stock
200 Hogs, single-deck	100.00	Stock
201 Hogs, double-deck	.50	Box
	99.50	Stock
210 Fresh meats, NOS	.87	Box
	99.13	Ref.
220 Meats, cured, dried, or smoked	52.50	Box
	47.50	Ref.
221 Butterine and margarine	3.50	Box
	96.50	Ref.
222 Packing-house prod., edible, NOS, not including canned meats	7.00	Box
	87.00	Ref.
	6.00	Tank
230 Poultry, live	100.00	Stock
231 Poultry, dressed	100.00	Ref.
240 Eggs	100.00	Ref.
250 Butter	.50	Box
	99.50	Ref.
251 Cheese	100.00	Ref.
260 Wool	100.00	Box
270 Hides, green	100.00	Box
280 Fish or sea-animal oil	50.00	Box
	50.00	Tank
281 Animals, live, NOS	20.00	Stock
	80.00	Ref.
282 Animal prod., NOS, (other than fert. & fert. materials)	44.00	Box
	.90	Hopper (O.T.)
	9.75	Gondola
	.23	Flat
	.12	Stock
	19.50	Ref.
	25.50	Tank

	Commodity group or class (1)	Assignment to equipment	
		Percent (2)	Class Of Car (3)
GROUP III	Products of Mines		
	290 Anthracite Coal	4.70	Box
		92.30	Hopper (O.T.)
		.60	Hopper (C.T.)
		2.40	Gondola
	300 Bituminous Coal	5.37	Box
		74.60	Hopper (O.T.)
		.08	Hopper (C.T.)
		19.74	Gondola
		.05	Flat
		.13	Stock
		.03	Other
	310 Coke	4.81	Box
		79.93	Hopper (O.T.)
		.24	Hopper (C.T.)
		14.84	Gondola
		.06	Flat
		.06	Stock
		.06	Other
	320 Iron Ore	3.68	Box
		83.65	Hopper (O.T.)
		.27	Hopper (C.T.)
		12.40	Gondola
	330 Copper Ore and Concentrates	4.00	Box
		48.20	Hopper (O.T.)
		1.80	Hopper (C.T.)
		46.00	Gondola
	331 Lead Ore and Concentrates	43.00	Box
		3.20	Hopper (O.T.)
		53.80	Gondola
	332 Zinc Ore and Concentrates	46.00	Box
		36.40	Hopper (O.T.)
		1.20	Hopper (C.T.)
		16.40	Gondola
	333 Ores and Concentrates, NOS	23.20	Box
		41.80	Hopper (O.T.)
		6.30	Hopper (C.T.)
		28.70	Gondola
	350 Gravel or Sand (other than glass or moulding)	5.20	Box
		19.00	Hopper (O.T.)
		.60	Hopper (C.T.)
		75.05	Gondola
		.15	Flat

Commodity group or class (1)	Assignment to equipment Percent (2)	Class Of Car (3)
351 Stone, broken, ground, or crushed	1.90	Box
	41.30	Hopper (O.T.)
	.04	Hopper (C.T.)
	55.10	Gondola
	1.45	Flat
	.21	Other
352 Stone, rough, NOS	2.20	Box
	20.40	Hopper (O.T.)
	.50	Hopper (C.T.)
	68.80	Gondola
	8.10	Flat
353 Stone, finished, NOS	15.00	Box
	6.30	Hopper (O.T.)
	60.30	Gondola
	18.40	Flat
360 Petroleum, crude	100.00	Tank
370 Asphalt (natural, by product or petroleum)	16.95	Box
	.25	Gondola
	82.80	Tank
380 Salt	94.56	Box
	.63	Hopper (O.T.)
	4.18	Gondola
	.63	Ref.
390 Phosphate rock, crude (ground or not ground)	68,69	Box
	13,78	Hopper (O.T.)
	14.45	Hopper (C.T.)
	3.08	Gondola
391 Sulphur (brimstone)	57.90	Box
	6.00	Hopper (O.T.)
	6.00	Hopper (C.T.)
	27.80	Gondola
	2.30	Tank
392 Products of Mines, NOS	32.10	Box
	39.80	Hopper (O.T.)
	2.50	Hopper (C.T.)
	24.70	Gondola
	.10	Flat
	.10	Stock
	.50	Tank
	.20	Other
820 Total Products of Mines		Box
		Hopper (O.T.)
		Hopper (C.T.)
		Gondola
		Flat
		Stock
		Tank
		Other

	Commodity group or class (1)	Assignment to equipment: Percent (2)	Class Of Car (3)
GROUP IV.	Products of Forests		
	400 Logs	8.04	Box
		.31	Hopper (O.T.)
		34.04	Gondola
		57.46	Flat
		.15	Stock
	401 Posts, poles, and piling	20.22	Box
		.90	Hopper (O.T.)
		35.57	Gondola
		42.94	Flat
		.37	Stock
	402 Wood (fuel)	29.80	Box
		5.00	Hopper (O.T.)
		13.60	Gondola
		50.70	Flat
		.90	Stock
	410 Ties, railroad	51.47	Box
		.80	Hopper (O.T.)
		.20	Hopper (C.T.)
		38.17	Gondola
		8.50	Flat
		.61	Stock
		.25	Other
	420 Pulp wood	53.70	Box
		5.10	Hopper (O.T.)
		11.10	Gondola
		28.40	Flat
		1.40	Stock
		.30	Other
	430 Lumber, shingles, and lath	85.65	Box
		1.00	Hopper (O.T.)
		7.50	Gondola
		5.70	Flat
		.15	Stock
	431 Box, crate, or cooperage materials	98.50	Box
		.20	Hopper (O.T.)
		.50	Gondola
		.50	Flat
		.20	Stock
		.10	Ref.
	432 Veneer and built-up wood	98.10	Box
		1.30	Gondola
		.60	Flat
	440 Rosin	79.47	Box
		20.53	Tank

Commodity group or class	Assignment to equipment	
(1)	Percent (2)	Class Of Car (3)
441 Turpentine	50.00	Box
	50.00	Tank
442 Crude rubber (not reclaimed)	97.14	Box
	2.86	Hopper (O.T.)
443 Products of Forests, NOS	85.95	Box
	1.40	Hopper (O.T.)
	6.50	Gondola
	5.10	Flat
	.35	Stock
	.70	Ref.
GROUP V. Mfg. and Miscellaneous		
450 Petroleum oils, refined, and all other gasolines	15.75	Box
	84.22	Tank
	.03	Other
451 Fuel, road, and petroleum residual oils, NOS	1.00	Box
	99.00	Tank
452 Lubricating oils and greases	53.60	Box
	46.40	Tank
453 Petroleum products, NOS	80.70	Box
	8.90	Ref.
	10.40	Tank
460 Cottonseed oil	7.50	Box
	92.50	Tank
461 Linseed oil	48.00	Box
	52.00	Tank
462 Vegetable oils, NOS.	18.30	Box
	6.10	Ref.
	75.60	Tank
470 Sugar (beet or cane)	100.00	Box
471 Table sirups and edible molasses	72.50	Box
	27.50	Tank
472 Molasses, blackstrap and beet residual	7.84	Box
	92.16	Tank
490 Iron, pig	.51	Box
	3.07	Hopper (O.T.)
	95.69	Gondola
	.73	Flat

Commodity group or class (1)	Assignment to equipment Percent (2)	Assignment to equipment Class Of Car (3)
491 Iron and Steel, rated 6th class in official classification NOS	.75	Box
	11.36	Hopper (O.T.)
	.05	Hopper (C.T.)
	87.70	Gondola
	.14	Flat
500 Rails, fastenings, frogs, and switches	10.60	Box
	1.32	Hopper (O.T.)
	78.60	Gondola
	9.28	Flat
	.20	Other
510 Cast-iron pipe or fittings	23.75	Box
	.85	Hopper (O.T.)
	.30	Hopper (C.T.)
	74.00	Gondola
	1.10	Flat
511 Iron and Steel pipe and fittings NOS	11.00	Box
	2.20	Hopper (O.T.)
	84.90	Gondola
	1.90	Flat
512 Iron and Steel: nails and wire, not woven	91.70	Box
	1.10	Hopper (O.T.)
	4.20	Gondola
	3.00	Flat
513 Iron and Steel, rated 5th class	25.00	Box
	1.60	Hopper (O.T.)
	70.50	Gondola
	2.90	Flat
520 Copper: Ingot, matte and pig	96.30	Box
	2.74	Hopper (O.T.)
	.96	Gondola
521 Copper, brass, and bronze: bar and pipe	97.25	Box
	.70	Hopper (O.T.)
	2.05	Gondola
522 Lead and zinc: Ingot, pig, or bar	97.00	Box
	.50	Hopper (O.T.)
	1.50	Gondola
	1.00	Flat
523 Aluminum: Ingot, pig or slab	96.00	Box
	4.00	Gondola
530 Machinery boilers	54.00	Box
	.25	Hopper (O.T.)
	22.10	Gondola

Commodity group or class	Assignment to equipment	
(1)	Percent (2)	Class Of Car (3)
540 Cement, natural or Portland (building)	82.00	Box
	.70	Hopper (O.T.)
	16.90	Hopper (C.T.)
	.40	Gondola
550 Brick, common	96.00	Box
	.65	Hopper (O.T.)
	1.65	Gondola
	1.40	Flat
	.30	Stock
551 Brick, NOS, and building tile	98.80	Box
	.25	Hopper (O.T.)
	.75	Gondola
	.10	Flat
	.10	stock
552 Artificial Stone, NOS	85.00	Box
	14.00	Gondola
	1.00	Flat
560 Lime, common (quick or slacked)	73.50	Box
	2.30	Hopper (O.T.)
	22.00	Hopper (C.T.)
	1.72	Gondola
	.38	Flat
	.10	Other
561 Plaster (stucco or wall) and dry Kalsomine	99.00	Box
	1.00	Hopper (O.T.)
570 Sewer pipe and drain tile (Not metal)	91.00	Box
	1.20	Hopper (O.T.)
	3.10	Gondola
	4.70	Flat
580 Agricultural implements and parts, NOS	70.00	Box
	1.50	Gondola
	28.50	Flat
581 Vehicle, horse-drawn, and parts, NOS	100.00	Box
582 Tractors and parts	50.00	Box
	.25	Hopper (O.T.)
	3.75	Gondola
	46.00	Flat
583 Railway car wheels, axles, and trucks	14.50	Box
	73.75	Gondola
	11.75	Flat

Commodity group or class	Assignment to equipment	
	Percent	Class Of Car
(1)	(2)	(3)
590 Automobiles (poss.)	45.50	Box
	.55	Hopper (O.T.)
	36.30	Gondola
	17.65	Flat
591 Autotrucks	60.20	Box
	.20	Hopper (O.T.)
	19.20	Gondola
	20.40	Flat
592 Automobiles and Autotrucks, K.D. and parts, NOS	52.45	Box
	.15	Hopper (O.T.)
	40.00	Gondola
	7.40	Flat
593 Automobile and autotruck tires	97.30	Box
	2.70	Hopper (O.T.)
610 Furniture, metal	100.00	Box
611 Furniture, other than metal	99.33	Box
	.22	Gondola
	.43	Flat
	.02	Other
620 Beverages	43.95	Box
	.05	Stock
	51.00	Refrigerator
	5.00	Tank
630 Ice	31.50	Box
	68.50	Refrigerator
640 Fertilizers, NOS	71,81	Box
	10.00	Hopper (O.T.)
	.43	Hopper (C.T.)
	17.76	Gondola
650 Newsprint paper	100.00	Box
651 Printing paper, NOS	100.00	Box
660 Alcohol, denatured or wood	40.00	Box
	60.00	Tank
661 Sulphuric acid	2.60	Box
	97.40	Tank
662 Explosives, NOS	96.69	Box
	1,89	Hopper (O.T.)
	.16	Gondola
	.16	Stock
	.79	Refig.
	.31	Other

Commodity group or class	Assignment to equipment	
(1)	Percent (2)	Class Of Car (3)
670 Cotton cloth or cotton fabrics NOS	100.00	Box
671 Bagging and bags, burlap, gunny, or jute	100.00	Box
680 Canned food products NOS	72.12	Box
	.08	Stock
	27.80	Ref.
690 Tobacco, mfg. products	98.00	Box
	2.00	Ref.
691 Paints in oil and varnishes	92.00	Box
	8.00	Tank
692 Furnace slag	3.70	Box
	64.70	Hopper (O.T.)
	.30	Hopper (C.T.)
	31.20	Gondola
	.10	Other
693 Scrap iron and scrap steel	2.91	Box
	5.02	Hopper (O.T.)
	91.73	Gondola
	.31	Flat
	.03	Other
694 Paper bags and wrapping paper	99.00	Box
	1.00	Ref.
695 Paperboard, pulpboard and wallboard (paper)	100.00	Box
696 Building paper and prepared roofing materials	100.00	Box
697 Building woodwork (millwork)	98.00	Box
	2.00	Gondola
698 Soap and washing compounds	98.00	Box
	1.50	Ref.
	.50	Other
699 Glass, flat, other than plate	98.00	Box
	2.00	Gondola
700 Glass: Bottles, jars, and jelly glasses	90.00	Box
	10.00	Ref.

Commodity group or class (1)	Assignment to equipment Percent (2)	Class Of Car (3)
701 Manufactures and Miscellaneous NOS	80.20	Box
	1.70	Hopper (O.T.)
	.45	Hopper (C.T.)
	7.00	Gondola
	3.00	Flat
	.10	Stock
	1.50	Ref.
	6.00	Tank
	.05	Other

* Percentage distribution calculated from available data obtained from the "Two Day Sample Study of Territorial Movement of Carload Traffic, May 17, and September 23, 1942", made by the Bureau of Economics and Statistics, Interstate Commerce Commission.

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